ASIIN Accreditation Report

Bachelor's and Master's Degree Programmes
Informatics
Information Systems

Provided by
Pavlodar State University
named after S. Toraighyrov, Pavlodar, Kazakhstan

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Table of Content

A About the Accreditation Process

Title of the degree Programme	Labels applied for [1]	Previous ASIIN accreditation	Involved Technical Commit-tees (TC)[2]
Ba Informatics	ASIIN Euro-Inf® Label	n/a	04
Ma Informatics	ASIIN Euro-Inf® Label	n/a	04
Ba Information Systems	ASIIN, Euro-Inf® Label	n/a	04, 02
Ma Information Systems	ASIIN, Euro-Inf® Label	n/a	04, 02

Date of the contract: 2009

Submission of the final version of the self-assessment report: 2013

Date of the onsite visit: 11 – 12 November 2015

at:

State University Pavlodar, Faculty of Physics, Mathematics and IT, Pavlodar, Kazakhstan

Peer panel:

Prof. Dr. Bettina Harriehausen-Mühlbauer, Darmstadt University of Applied Sciences

Prof. Dr. Axel Hunger, Universität Duisburg-Essen

Aigerim Madiyeva, student peer, al-Farabi Kazakh National University, Kazakhstan

Evangelos Nikolaropoulos, Philips Medical Systems

Prof. Dr. Rüdiger Reischuk, Universität Lübeck

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

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

Peer representative of National Educational System: Makambayev Murat Bolatovich, Kazakh Humanitarian Juridical Innovative University, Kazakhstan
Representative of the ASIIN headquarter: Dipl. Des. Katrin Wellmann
Responsible decision-making committee: Akkreditierungskommission für Studiengänge
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 04 – Informatics/Computer Science as of 09.12.2011 Euro-Inf® Framework Standards and Accreditation Criteria for Informatics Programmes as of 2011-06-29

In order to facilitate the legibility of this document, only masculine pronoun 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	b) Areas of Specialization	c) Mode of Study	d) Duration & Credit Points	e) First time of offer & Intake rhythm	f) Number of students per intake	g) Fees
Ba Informatics B. Sc. (Bachelor of Natural Science)		full-time / part-time	8 semesters; 240 ECTS	September 2004; autumn semester	40-50	340000 kzt / year (full-time) 180000 kzt/year (part-time)
Ma Informatics (Master of Natural Science)	• profile (M. Sc.) • pedagogical/ scientific (Master of Natural Science)	full-time	3/4 semesters; 100/160 ECTS	September 2004; autumn semester	8-15	440000 kzt/ year
Ba Information Systems (Bachelor of Processes and Technology)		full-time / part-time	8 semesters; 240 ECTS	September 2004; autumn semester	40-50	340000 kzt / year 180000 kzt/year (part-time)
Ma Information Systems (Master of Processes and Technology)	• profile (M. Sc.) • pedagogical/ scientific (Master of Processes and Technology)	full-time	3/4 semesters; 100/160 ECTS	September 2004; autumn semester	8-15	440000 kzt/ year

The following information on objectives and learning outcomes (intended qualifications profiles) is published in English for the degree programme **Bachelor of Information Systems** on the department's website

(http://www.psu.kz/index.php?option=com_content&view=article&id=77&Itemid=30&lang=eng, access 18 November 2015):

"**Specializations:**

- Information Systems in Economics

- Information Systems in Engineering

Qualification: **Bachelor of Engineering and Technology**

Professional activity areas:

Public and private companies and organizations developing, implementing and maintaining information systems in various fields (engineering, metallurgy, transport, telecommunications, science and education, healthcare, agriculture, the service sector, administration, economics, business, management of various technologies).

Typical tasks of professional activity:

- design and development of various components of information systems;

- installation, configuration and administration of the network infrastructure of information systems;

- design and administration of information systems databases;

- providing information, software, technical, organizational and legal support of information systems and their elements.

Persons with higher education in the specialty **5B070300 Information Systems** may hold the following positions:

- programmer, WEB-programmer;

- administrator of information systems databases;

- systems analyst;

- computer systems administrator;

- specialist in the field of information security and data protection;

- other positions related to the use of information technology by industry."

The following information on objectives and learning outcomes (intended qualifications profiles) is published in English for the degree programme **Bachelor of Informatics**:

"Qualification: **Bachelor of Natural Science.**

Professional activity areas:

- implementation of the production, design and research activities in the fields using the methods of computer science and applied mathematics;

- ensuring the effective operation and management of organizations in accordance with the trends of modern information technologies;

- pedagogical activities in educational institutions of secondary, primary and secondary vocational education, training centers in IT technologies.

Types of professional activities:

- ***research projects:*** analysis, theoretical and experimental study of methods, algorithms, software, hardware and software packages and systems;

- ***industrial and technological activities:*** creation of components of computer systems, automated systems and production programs and software systems of specified quality at a given time; testing and debugging hardware and software systems;

- ***organizational and managerial activities:*** selection of technology and tools in the organization of the process of research and development of professional activity objects; organization of individual stages of professional activity objects development process; evaluation, monitoring and managing the development of professional activity objects;

- ***designing:*** development of requirements and specifications of the individual components of professional activity objects based on analysis of user requests and opportunities of technological tools; design of architecture software and hardware complexes components; designing HMI of hardware and software systems;

- ***education:*** design, development and implementation of the latest computer technology in the learning process; development of teaching materials based on modern methods, tools and technologies in accordance with the established standards; implementation of various forms of distance education, electronic forms of performance control.

Persons with higher education in ***5B060200 Informatics*** may hold the following positions:

- *programmer, specialist in the field of computer-aided design,*

- WEB-programmer,

- a specialist in the field of object-oriented programming,

- database designer in management organizations and business structures, computational and computer centers;

- teacher of computer science and computer cycle disciplines in institutions of secondary, primary and vocational secondary education;

- other positions related to the use of IT-technologies in professional activities."

According to the self evaluation report (SER) the following objectives and learning outcomes (intended qualifications profile) shall be achieved by the **Master degree programmes** (no differentiation between Ma Informatics and Ma Information Systems):

"Graduates on educational programs of masters program have to have fundamental scientific and vocational training, own modern information technologies, including methods of receiving, processing and storage of scientific information, to be able to formulate and solve modern scientific and practical problems, to plan and messages research / experiential- research activities for the selected scientific specialty, to teach in higher education institutions, successfully to carry out research and administrative activity."

C Peer Report for the ASIIN Seal[3]

1. The Degree Programmes: Concept, content & implementation

Criterion 1.1 Objectives and learning outcomes of the degree programmes (intended qualifications profile)

Evidence:

- Self evaluation report (SER)
- Discussions during on-site visit
- the department's website:

  http://www.psu.kz/index.php?option=com_content&view=article&id=74&Itemid=30&lang=eng (access: 18 November 2015)

  and the programmes description on the website:

  http://www.psu.kz/index.php?option=com_content&view=article&id=77&Itemid=30&lang=eng (access: 18 November 2015)

Preliminary assessment and analysis of the peers:
The programmes under review are situated in the university's Department of Mathematics and Informatics of the Faculty of Physics, Mathematics and Information Technology. The Bachelor's and Master's degree programmes Informatics and Information Systems seek to correspond to the qualifications of the European Qualifications Framework level 6 (Bachelor) and 7 (Master) respectively.

The panel notes that the presentation of programme objectives in the SER are not programme-specific and distinctive enough by not differentiating between the two Bachelors Informatics and Information Systems and the two Masters Informatics and Information Systems. From the peers' perspective it does not become fully clear from the SER in which aspects the acquired competences of graduates and their intended areas of professional work in the respective programmes differ. The peers deem it difficult to discern if the intended qualifications profiles allow the students to take up an occupation which corre-

[3] 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.

sponds to their qualification (professional classification). They can follow the students' and teachers' elucidations and agree to the definition that the graduates of Informatics need competences mainly in modelling, technologies of programming, computer design and graphics to be able to find occupations in Kazakh factories and scientific laboratories. However, the interviewees define the competences of graduates of Information Systems as lying in the fields of information technology with a more technical focus like the development of programming and configuration of systems, aiming to earn jobs in Kazakhstan as e.g. the automatization process leader at a school who e.g. organizes distance learning systems or as employees of factories or smaller companies with their own information system basis. In order to educate their students in alignment with the local industry's needs, the HEI regularly evaluates questionnaires issued to regional companies asking for their needs and the existing satisfaction with employed graduate. Also, it indicates to evaluate statistical data on the requirements of the region. While the panel finds that the differences seem to be very clear to staff and students who explain this in the interviews on site and also witness to the fact that there is a strong local and regional job market, it questions why this is not demonstrated clearly enough in the SER (and in the Diploma Supplements or on the HEI's website regarding the Master programmes). The auditors also ask for more informative statistical data regarding the job situation of graduates as additional material (see section D) to be provided by the university after the on-site visit, because the information given in the SER – especially regarding the Master graduates – is founded on a very low data base.
The panel also questions the provided differentiation between the profile and the pedagogical direction of the Masters' programmes as none of the Master students of the current academic year (4 Ma Information Systems, 5 Ma Informatics) or of the last years has chosen the profile direction, everyone has aimed at the Master with scientific/pedagogical focus, aiming to later be employed by a university or other educational institution. (Furthermore, state grants are only granted for students of this direction.)

Additionally, the qualification objectives and intended learning outcomes at programme level as formulated in the SER differ from the list of typical tasks and professional activity areas as found in English on the HEI's (higher educational institution) website. Information should be better aligned and presented transparently to all stakeholders.

According to the peers' analysis, the objectives and learning outcomes aim to reflect the level of academic qualification. However, the peers cannot judge currently if these are generally aligned to the learning outcome examples described in the respective ASIIN Subject-Specific Criteria (SSC) of the Technical Committee 04 – Informatics. Therefore, they ask to hand in the Objectives-module-matrix according to ASIIN template (see section D).

Criterion 1.2 Names of the degree programmes

Evidence:

- Rules and regulations
- SER

Preliminary assessment and analysis of the peers:
The degree programmes' names reflect the intended aims and learning outcomes as well as, fundamentally, the main course languages Russian and Kazakh. The peers come to this conclusion after learning that the names given in the SER (Informatics and Information Systems) were translated only for the peers' sake. The Kazakh ministry provides the names, i.e. defining names of the degree programmes.

However, the panel questions if the names clearly reflect the linguistic focus of the degree programmes. From its perspective it should be clearly identifiable in which language the courses are being taught. Since all modules are taught twice, once in Russian and once in Kazakh, the programmes should be named accordingly.

Criterion 1.3 Curricula

Evidence:

- Study plans (SER)
- Module descriptions (SER)
- Discussions during on-site visit

Preliminary assessment and analysis of the peers:
The modules are described in module handbooks which are available for students in their personal "student office", an online tool used by the department for all information purposes. The auditors judge the module descriptions from the provided information in the SER and appendices as well as from the interviews.

The lists of modules presented for the respective programmes consist of 30-45% compulsory modules which are government-defined, 55% of the modules are defined by the faculty in the Bachelor's and 70% in the Master's programmes.

The compulsory modules contain subjects such as (for the Bachelor Informatics): mathematical analysis, analytical geometry and linear algebra, informatics, ecology and emergency management, philosophy and political science, discrete mathematics as well as

general topics like social disciplines, language training on speciality, law basics and economics, poly-language training;

or (for the Bachelor Information Systems): mathematical analysis, algebra and geometry, physics, probability theory and mathematical statistics, informatics, philosophy and politology, ecology and health and safety as well as general topics like public disciplines, language preparation on specialty, right and economy bases, polylanguage preparation, accounting and audit.

Since the SER stems from 2013, the peers ask if the curricula had been changed significantly ever since; the programme coordinators denied this. The HEI informs the panel that changes to the curriculum are made every four years, electives are changed regularly according to the technological development and the industry's informally obtained needs (e.g. in the previous years Delphi was taught, now the programmes have started teaching Object Oriented Programming (e.g. C++ or Java), whereas mandatory modules requested by the national ministry stay the same.

The panel has difficulties finding concrete and clear overviews of the programmes' curricula as they seem not to be widely differing between Informatics/Information Systems, but also between profile/pedagogical directions in the Masters as well as economic/engineering specializations in the Master of Information Systems. It asks for additional material (see section D), possibly graphic tables showing the different curricula clearly.

According to the information presented by the HEI, each student designs his individual curriculum (IC): A student's curriculum which is independently formed for every academic year with help of an academic advisor (mostly assistant professors) on the basis of the standard curriculum and a catalogue of elective disciplines. Following the HEI, this allows the students to achieve the intended learning outcomes.

Auditors find further information on the department's website: It explains that according to the standard of the programme Bachelor Information Systems, the following courses shall be studied by students: *Algorithmization and Programming Languages, Basics of Information Systems, Information Security and Data Protection, Circuit Engineering, Programming Technology, Database Systems, Computer Systems Architecture, Basics of Computer Modeling, Economics and Organization of Production, WEB Technology, Computer Networks.* Elective courses (depending on the specialization: IS in Economics or IS in Engineering) are: *Software of Economic Calculations (computer-aided design , mathematical calculations), Numerical Methods, Business Accounting and Audit, Theory of Decision-making, Basics of Mass Service Theory, Intelligent Information Systems, Designing of Information Systems, Modern Programming Languages, New Information Networking Technology, Information Marketing (Management), Information Systems Reliability, Data*

Analysis in Economic Informational Systems, Legal Groundwork for Information Security, Design and Construction of Multimedia Systems, Data Processing Methods.

The panel welcomes this detailed information, while there is no similar information to be found published on the website regarding the Bachelor of Informatics or the Masters.

After studying the module descriptions in the module handbook it is not fully clear to the panel which knowledge, skills and competences students will acquire in each module. From their perspective, the compulsory curriculum for the students should cover the core areas of the field of computer science (in particular theory of computation, algorithms and data structures, programming methodology and languages, and computer elements and architecture) to ensure that all Bachelor graduates acquire the intended fundamental competences.

The objectives and contents of the modules are not adequately defined as they are too generic and do not provide information of the specific features of the programmes from the auditors' perspective (some wording sounds confusing which may also be a problem of translation). They analyze the module handbook to find several redundancies/repetitions (e.g. Logical Culture of Programming has identical content and aims as System Programming and Theoretical Bases of Computer Science and Predicate Programming Methods Verification; Modern Programming Languages has identical content as Advanced Software Development…). Furthermore, in some modules the pre-requisites are the same as the objectives and/or content of the module (e.g. philosophy, political science). The panel assumes that this could also be a problem of translation. Additionally, the auditors note that some module descriptions are missing completely, e.g. the module for the bachelor thesis and the internships.

For the revision of the module descriptions see criteria 1.3 and 5.1 (and section D), while this is mentioned here only to explain the panel's reluctance to finally confirm the curricula's fitness for the purpose of all students (especially the Bachelors) acquiring the intended fundamental competences. They ask for additional material (see section D) regarding the curricula.

Regarding the provided information, the panel also questions if social competences, such as project management competences and the capacity for teamwork and communication is considered sufficiently in the degree programmes to reach the intended learning outcomes. In the interviews they find confirmed that project work is not group work, students working on projects individually or as pairs only. There is only one module that contains group work (web technologies), there is no module that teaches modern project management methods. With regard to the Master Programme, there is also the problem of very few students per semester (4-5 each), so that group work becomes difficult to

implement and offered electives have to be decided jointly; the students have to agree which elective can be selected together.

Also, the need for assistance and lessons in English for all students and most staff members became evident during the visit. This is particularly crucial given the intended learning outcome that students should be able to communicate in English and compete on an international academic level. The peers consider basic command of the English language as a necessity for academic lecture and publication, especially with regard to international publications in journals and other competitions regarding state of the art developments in the continuously changing field of informatics.

In this context also falls the topic of the Master thesis. The provided theses from both Masters cite predominantly literature (often outdated) in Russian while staff and peers agree that up-to-date academic research in the field of informatics and information systems requires to include literature that may have been recently published in English only.

In addition, the peers consider the provided samples of Master theses of the pedagogical/scientific direction do not meet the European standards of the EQF level 7. (There are no profile direction Master theses provided because there are none; students do not choose the profile direction, because grants for profile Masters are not given by the government.) The peers analyze them to be in general below expectations for the envisaged academic level. They contain more applications or evaluations of systems, comparisons of systems than original new solutions on a scientific level. The auditors based their assessment on the abstract in English provided on the front page of the thesis, the shown level of research by the list of literature and the programming code at the end which is generally uncommented.

The panel finally comes to the conclusion that the provided samples of Master theses are mostly on a level below EQF level 7. As one of the reasons they find that the students of the Master's degree programmes do not consider current international publications (finding almost only Kazakh or Russian literature in the bibliographies, no international publications and conference proceedings). On Master level, the topics need to reflect a high degree of originality. The work also needs to include thorough research of the given topic, including international publications, projects and research results. The thesis also needs to describe the chosen methodology, a clear design of how the goal was reached and an academic, critical discussion of the work. The entire work needs to be on EQF level 7. While both programmes' Master theses do deliver an important service to the local industry and, in general, to Kazakh society which is in the process of digitalization and automatization, according to the peers they do not reflect the European standard. The peers conclude that the Master graduates would not be able to perform a PhD thesis on

an international level. Finally, the qualification objectives stated in the self evaluation report had not been realized in the theses provided during the on-site visit.

By the same token, the panel criticizes the absence of specialized and well-equipped research laboratories in order to introduce students to state of the art technologies and research methods. To reach the intended learning outcomes, students need to be able to work regularly with these technologies, the panel underlines (see also criterion 4.3).

In this context, the peers also express the idea to generally increase research activities in order to ensure high quality education considering that up to date research results are usually affecting teaching activities.

Criterion 1.4 Admission requirements

Evidence:

- Appendices of SER including Standard Regulations of Admission

Preliminary assessment and analysis of the peers:
The requirements and procedures concerning admission are transparently documented. The auditors learn at the on-site visit that the maximum of expected intakes per study year is specified by the national ministry of education: The ministry gives a limit of students who can enroll in the study programmes. The number of students enrolled in the degree programmes has declined over the last years due to demographic reasons according to the university. The auditors note that tuition fees are charged but that, in fact, most of the students receive state scholarships or research grants, which also free them of tuition fees. The higher the score in the national examinations following school graduation (4 elective, 1 mandatory test), the greater is the chance to receive a scholarship. Enrolment on a fee (contracted) base is possible but only very few students pay the fees themselves.

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

The peers highly appreciated the additional provided qualification profiles, Diploma Supplements and statistical data for the Bachelor and Master degree programmes.

For both Bachelor programmes the peers consider the qualification profiles as subject-specific and distinctive. The statistical data provided give an insight into employability of the graduates.

However, the statistics on employability especially for the Master programmes aren't very significant, as the number of graduates (2 in each of the Master programmes) is still very low. The peers encourage the university to take in more Master students.

After having reviewed the curricula of both Bachelor programmes the peers assess that the structure of the curriculum does not always ensure the intended learning outcomes/qualification objectives which should be reached by the students. They are missing the red thread in both Bachelor curricula. With other words they are missing the logical sequence of modules which build on each other. The peers would like to give on example. For example fundamental theoretical concepts of the discipline Informatics (in particular theory of computation, algorithms and data structures, programming methodology and languages, and computer elements and architecture) are taught in the module "Theory of languages and automata" offered in the Bachelor programme Informatics. This fundamental theoretical knowledge is needed for modules later taught in the curriculum. However, these theoretical concepts are not offered in the Bachelor programme Information Systems which seems unclear to the peers as later taught modules in the field of program verification can only be understood on the bases of these pre-requisites. Another example is the introduction to Flash technology in the Bachelor Information Systems as computer graphics are only taught in the Bachelor programme Informatics. The peers question the need of Flash technology in the curriculum of the Bachelor Information Systems as it seems unclear for what students should use this knowledge. In summary, modules taught in the early stage of the curriculum are pre-requisites for later taught modules, so the modules in the curriculum should be presented in thematically and chronologically coherent manner in both Bachelor programmes. Furthermore, imparted content should be coherent within the curriculum and with the intended learning outcomes of the respective study programmes. The peers require the university to revise these curricula in terms of logical sequence of modules which build on each other and which are presented in a chronologically coherent manner.

After having reviewed the additional provided curricula and module handbooks the peers upheld their requirement that social competences, such as project management competences, the capacity for teamwork and communication should be fostered within the Bachelor degree programmes to reach the intended learning outcomes.

Furthermore, the presented curricula for the Bachelor and Master programmes (graphics, tables) help the programme coordinators of the respective study programmes to prove that the government-defined standards are implemented into the curriculum; however it doesn't show the imparted content/modules allocated to the core areas informatics, specialized modules in informatics and information systems, mathematics/natural science, languages and social competences such as project management competences, the capaci-

ty for teamwork and communication etc.. The panel requires revising the presented curricula (graphics, tables) in accordance to the above mentions aspects as in terms of ASIIN standards as well as Euro-Inf label standards the imparted content has to be made transparent to the stakeholders (students, employers etc.).

Regarding the presented curricula of the Bachelor and Master programmes it still remains unclear to the panel which modules are mandatory for every student and to which extent a student can choose modules (electives) from an elective course list in the respective degree programmes. The peers would like to point out that there might be a misunderstanding in terms of wording. By mandatory/compulsory courses the peers refer to modules students have to take irrespective if these are government or faculty-defined. With electives/optional components the peers refer to a set of modules where students can choose from (e.g. students have to choose 3 elective courses from a list of 10 offered elective modules). It seems to the peers that no electives are offered and all courses have to be taken by the students. In order to allow students to define an individual focus in their studies the panel highly recommends offering elective courses to the students.

The panel still has difficulties to differentiate the two Master programmes Informatics and Information Systems in terms of qualifications profiles (qualification objectives/intended learning outcomes) and the curriculum. If a university offers two distinctive Master programmes the qualification profiles and especially the content of the modules has to show that these are two distinctive Master programmes with different focus. The peers assess that the presented curricula show mainly the same modules. The information system related contents are marginally more treated in the Bachelor Information Systems. However, the peers come to the conclusion that the Master programmes do not differ content-wise sufficiently to allow students to set an individual focus.

As mentioned above for the Bachelor programmes the peers are missing in the Master programme as well the logical sequence of modules which build on each other. For example it is unclear to the panel why the content of the module “Controllers and Simulators” is taught in the Master programme Information Systems as it doesn’t seem programme-specific. In addition, the panel questions if the curriculum of the Master programme Information Systems which includes only basics of Java and some optional components in System Analysis does correspond to the Master level according to EQF level 7. The peers require the university to revise these curricula in terms of logical sequence of modules which build on each other and which are presented in a chronologically coherent manner.

The module „Project management and teamwork/Project Planning“ taught in the Master programme Informatics should be included to the Master Informations Systems too in order to reach the intended learning outcomes.

The peers uphold their impression that the level of the Master thesis does not correspond to scientific standards of the EQF level 7. The auditors based their assessment on the abstract in English provided on the front page of the thesis, the shown level of research by the list of literature and the programming code at the end which is generally uncommented. The presented theses contained more applications or evaluations of systems, comparisons of systems than original new solutions on a scientific level. The peers find that the students of the Master's degree programmes do not consider current international publications (finding almost only Kazakh or Russian literature in the bibliographies, no international publications and conference proceedings). On Master level, the topics need to reflect a high degree of originality. The work also needs to include thorough research of the given topic, including international publications, projects and research results. The thesis also needs to describe the chosen methodology, a clear design of how the goal was reached and an academic, critical discussion of the work. Finally, the qualification objectives stated in the self evaluation report had not been realized in the theses provided during the on-site visit.

The panel encourages the university to develop standards and guidelines for the Master thesis according to the EQF level 7. Nevertheless, based on the current level of the Master thesis which does not correspond to the Master level according to EQF level 7 the peers recommend to suspend the accreditation procedure for the Master programmes Informatics and Information Systems. Due to the fact that the student intake per year is very low (4-5 students intake in each Master programme per year) the panel doubt that the university may hand in additional Master theses meeting the EQF level 7 standards within 9 month if only an requirement (instead of the suspension) would be made.

Overall, the peers assess this criterion to be partly fulfilled for the Bachelor programmes.

They recommend suspending the accreditation procedure for the Master programmes Informatics and Information Systems.

2. The degree programmes: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Module descriptions (SER)
- Provided study plans

Preliminary assessment and analysis of the peers:
The degree programmes are divided into modules. Each module is a sum of teaching and learning whose contents seem to be concerted, while the peers criticize the module descriptions (see criteria 1.3 and 5.1) and ask for revised versions in order to fully judge the alignment to the intended learning outcomes and the students' possibilities to define an individual focus and course of study. The panel also notes that there is no objectives-module-matrix given in the SER which would support an analysis.

While the HEI vouches for the quality of working practice intervals or internships in terms of relevance, content and structure, the working practice is not proven to be well-integrated into the curriculum. The HEI explains that it is necessary and compulsory for all students to gain professional practice in industry, that is why the working practice intervals are spread over the whole study period (one week of "educational" practice in the summer after the second semester; two weeks of industrial practice after the fourth semester; five weeks of practice after sixth; five-six weeks after seventh semester). The HEI explains on enquiry of the panel that in the educational practice period the students solve different programming tasks on-site at the university, supported by a teacher, and then write a report about their coding. The peers would not have subsumed this under working practice or internship. From their perspective the total number of practical training therefore is around 12-13 weeks. The peers discuss if the short intervals do foster the working experience because one first needs to be familiarized with the working environment before one can meaningful contributions. Additionally, the peers remark that the importance and the workload of the practical intervals are not reflected in the structure of the programmes: Work experience is marked down with 2 ECTS points (the module handbook notes 4 credits, possibly national credits) which would correlate to around 50-60 hours of work, not the presumable ca. 480-520 hours (weeks times 5 work days times 8 working hours). From the peers' analysis working practice intervals should be demonstrated to be more relevant and credited thus. (The problem of creditation is treated with more depth under criterion 2.2.)

Concluding, according to the peers the module descriptions are in need of revision (they should include reliable information about the content, qualification objectives, teaching formats, admission requirements, conditions for the award of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s) of assessment and details explaining how the module mark is calculated as well as a module identification code and the date of the last amendment made.) Missing descriptions (e.g. thesis, internships) should be added and identical descriptions for different modules eliminated.

There is no explicit window of mobility defined. When asked by the peers, the HEI explains that students have the opportunity to leave for an exchange semester or practical internship between the 3rd and the 6th semester; however, the numbers of mobile students are very low. In the students' interview some students indicate the wish for more international cooperations and possibilities to spend a semester at another HEI. Other students explain that mobility and internationality do not really concur with the envisaged work opportunities in the local region. Nevertheless, the panel deems it worthwhile to support and assist students who want to go abroad. The peers underline that an international working or study experience fosters the development of the students' personality and would enhance language skills as well as the overall qualification also for work placements in the region.

Criterion 2.2 Work load and credits

Evidence:

- Module lists and descriptions inform about the ECTS creditation in the individual modules.

Preliminary assessment and analysis of the peers:

Questioning the ECTS credit points awarded to different modules, the panel finds that the national credit point system is translated by a given formula (issued by the Kazakh ministry, and updated a short while ago) into ECTS credit points. The Kazakh credit points and the conversion into ECTS credit points is not always implemented comprehensibly and reproducibly as the auditors indicate. (In some cases 1 ECTS seems to be equivalent to 12 hours, in other cases equivalent to 35 hours.) Peers point out to the HEI that the ECTS credit point system is obviously not yet fully oriented on the amount of work (work load comprising both attendance-based learning and self-study) required from students, seeing that one semester includes 60 ECTS, while others are well below. Should indeed 60 ECTS (1 ECTS defined as 25-30 working hours) be required from students during that

study phase, peers would consider it a heavy overload. But students do not complain about an overload in the peers' interview.

From the panel's perspective there is currently no way of knowing with certainty if the estimated time budgets are realistic and correspond to the actual work load of the students to complete the degree without exceeding the regular course duration (standard time to degree). The peers find it necessary to look at the results of teaching evaluations in order to ensure a feasible work load and therefore require additional material (see section D) regarding these statistics. They ask the students during the on-site visit for prolonged study periods which seem to be rare at the HEI – students seem content and able to finish their studies on time, they do not report structurally caused peaks in work load. In the eyes of the peers, there does not seem to be a problem of overload, although they do insist on checking via the requested additional statistical material.

For the time being, the panel comes to the conclusion that the workload concept is not fully implemented into the programme. Workload and ECTS relation are not consistent (e.g. work experience) and need to be revised.

Criterion 2.3 Teaching methodology

Evidence:

- Module descriptions (SER)

Preliminary assessment and analysis of the peers:
The teaching methods and instruments used generally support the students in achieving the learning outcomes, according to the peers' analysis. Academic staff seems very motivated and eager to professionally instruct, teach and lecture the students. The balance between attendance-based learning and self-study cannot be judged fully by the panel because of the missing information required with the additional material to be provided by the HEI.

Asking what the differentiation in the SER between "practical lessons" and "lections and laboratory lessons" means, the peers learn that laboratory work is conducted individually with methodological instructions by a teacher, while practical assignments are worked on in pairs of two students. The peers suggest the adoption of group work on a project basis to fully reach the intended learning outcomes regarding abilities and skills needed in the workplace.

The HEI informs the panel that the basics of computer modeling are taught as projects in course work, but the overall number of students is too small to form bigger groups and assign them project tasks with different roles.

Especially with regard to the Master's degree programmes, the panel misses elements in different modules that are suitable to familiarize the students with independent academic research. To be able to fully assess the fitness of the teaching methods for the attainment of the programmes' objectives, the panel needs the revised module descriptions (see section D, additional material).

Criterion 2.4 Support and assistance

Evidence:

- On-site discussions
- SER

Preliminary assessment and analysis of the peers:
Since the staff is numerous there are sufficient resources to provide individual assistance, advice and support for all students. Each student has his own personal academic advisor (mostly assistant professors). Students seem very content with the teacher-student ratio and relationship, depicting an open atmosphere. Furthermore, students benefit from the personalized online system that provides them with all relevant information and supports the students in achieving the learning outcomes within the scheduled time.

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

The panel's final assessment regarding the structure of the curricula is included in the criterion 1.

The peer's final assessment regarding the module descriptions is presented in criterion 5.

The module descriptions for the Bachelor programme Informatics and the Master programmes Informatics and Information Systems state that 1 ECTS corresponds to 30 hours overall workload. However, the module descriptions of the Bachelor programme Information Systems state that 1 ECTS corresponds to 22, 25 or 31 hours overall student workload. The student workload calculation is not coherent and seems unclear to the peers. With regard to the transparency for the stakeholders the ECTS calculation should be coherent within the programme.

The peers consider the workload and ECTS relation as not consistent (e.g. work experience) and recommend to assess the actual student workload for each module on a regular basis. However, for the time being the peers consider the overall student workload as adequate taking into account that students did not mention any overload or structural peaks and seemed very satisfied with the study programmes.

The peers additionally recommend to support and assist students in order to gain international working or study experience. Furthermore, working practice intervals should be relevant and credited thus.

Overall, the panel considers criterion 2 to be partly fulfilled.

3. Exams: System, concept and organization

Criterion 3 Exams: System, concept and organization

Evidence:

- Module descriptions (SER)
- Regulations in appendices
- Discussions on-site

Preliminary assessment and analysis of the peers:
The programmes' examinations are devised to individually measure to which extent students have reached the learning outcomes. The examinations are, in general, module-related (while some modules can consist of 2-3 exam components) and offer students continuous feedback on their progress in developing competences (exams being organized in a system: two informal exams: one internal exam checking the knowledge by pre-requisites, one mid-term exam; and at the end of the term the final, formal exam). All rules have been defined for re-sits etc. All examinations are organized in a way that avoids delays to student progression caused by deadlines, exam correction times, re-sits etc. Examinations can be repeated until the student passes or even reaches the grade he aims at; a test can be taken more than three times. This explains why almost no students abort their studies and almost all finish in the regular study period, the peers hypothesize. When students fail an examination, they have to take the whole class again in summer school in order to retake the examination in the next semester.

The number and distribution of the examinations seems to the panel to ensure that both the exam load and preparation times are adequate. The students themselves report no overload.

Since module descriptions need to be revised thoroughly, the panel awaits the final definition of forms of assessment (including suitable alternatives, if any) for each module.

While the Master's degree programmes do comprise a thesis/dissertation as a final exam, the panel questions if the provided sample theses are at a level which ensures that students work on a set task independently and at the level aimed for. Regarding the academic level EQF 7, the Master thesis needs to contain scientific discussion, academic research and original solutions (see criterion 1.3 for a detailed analysis).

They ask the HEI for the definition of transparent criteria regarding the marking of exams (especially the Master's theses). Also, statistical data referring to the years 2010-2015 is asked to be provided to analyze the exam and grading system as well as the students' success rate properly (see section D, additional material).

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

The panel appreciated the further explanations from the Pavlodar State University and found criterion 3 to be fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- No teaching load matrix across departments (differentiated Kazakh/Russian teaching) provided in the SER (see section D, additional material)
- Staff list (SER and separate staff list provided before the on-site visit)

Preliminary assessment and analysis of the peers:

According to the panel's analysis there are sufficient staff resources available to sustain the degree and provide assistance and advice to the students as well as to attend to administrative tasks. The high teaching staff – student ratio is appreciated by the peers. The modules concerning basic and profile disciplines are conducted by the departments of the faculty of physics, mathematics and information technologies; the modules concerning general education disciplines are provided by the faculty of specialized departments, as the SER informs. There are 28 teaching professors and associative professors (amongst them 3 candidates of PhD) at the moment, who also provide compulsory teachings for other departments. 12-15 lecturers teach the core subjects of informatics and infor-

mation systems according to the on-site interviews. The only gap the peers encounter lies in the field of project management methodology as outlined previously.

The staff workload seems to be adequate, while the panel is missing an overview in form of a teaching load matrix. Academic teaching load is, following the interviews, around 650 hours/year (15-max. 20 hours/week). Administrative tasks are also fulfilled by staff as well as assisting and advising the students personally.

Peers are surprised to find that there are almost no lecturers employed on a long-term basis; academic staff members have only fixed-term contracts of 1-5 years. In this context, they question if high quality research is fostered by this fact, because from their experience it does need a high level of continuity in the academic staff in order to plan and conduct long-term research and support the level of academic qualification aimed at. The peers ask about the differentiation of teaching staff in the SER regarding the columns "academic degree" and "scientific degree" and learn that the first means staff with a Master's degree and the second with a PhD-degree.

In this context, the peers also express the idea to generally increase research activities in order to support the further development of the staff and ensure high quality research (see criterion 4.2).

Criterion 4.2 Staff development

Evidence:

- SER
- Discussions during on-site visit

Preliminary assessment and analysis of the peers:
According to the HEI, staff development is planned and secured by annually 20% of staff going abroad to raise their level of skills by researching or lecturing; however, sometimes staff members visit a congress or a seminar which is also perceived as academic development. Some professors leave on grants from Erasmus to do research in e.g. the Czech Republic or Spain, or with support of the national programme (Bolashak): Every 2 years a professor can leave for 1-4 months on a stipend, the salary being paid and the position at the HEI being secured. Since some of the professors are still working on their PhDs, it is possible for them to take off one semester to finish their PhD thesis.

According to the panel, it is generally desirable to encourage and enable staff to publish research work internationally. From the panel's perspective, the HEI should plan to im-

plement a policy regarding sabbaticals in order for academic staff to develop its didactic, technical and subject-specific skills further.
As a major obstacle to international pursuit of academic profiling, the peers analyze the inadequate command of the English language; very few members of academic staff speak or read English on a more than basic level. Asked by the peers, how lecturers stay informed of current international developments in their specific field, some report to read published articles with an online translating system, others read only Russian or Kazakh publications. Thus, the peers deem it necessary to provide lessons, advice and assistance in oral and written English to staff (and students), especially with regard to publications in international journals, presentations at international conferences and international professional competition.

Criterion 4.3 Funds and equipment

Evidence:

- Library and lab inspections at on-site visit
- Discussions during on-site visit

Preliminary assessment and analysis of the peers:
While the peers find the library to be large, they do comment on the low percentage of prevailing programme-specific international literature. They welcome that students can download international journals online for free (Elsevier, Springer link provided by the HEI).

The peers also visit the laboratories and find that they are generally below the European standard level. They miss a specific up-to-date laboratory environment and equipment for research. With regard to high educational research the panel sees the existence and usability of well-equipped research laboratories as necessary in order to introduce students to state of the art technologies – as well as enable them and the academic staff to conduct research.

Asking for the programmes' finances the coordinators report that the governmental funding is limited and does not cover the expenses for all required equipment. The students' fees do not cover expenditures sufficiently, either, especially since student numbers are declining and many students study on a grant. The HEI reacts by cutting costs (decreasing business trips, lowering the staff bonus and others) and increasing marketing activities.

Furthermore, externally funded projects (with local industry or European project organizations), while welcomed very much by the panel, are few with low income as presented by the programme coordinators (e.g. TEMPUS project); the local industry also covers the

students' grants for those who work for them on projects. Some numbers shown (e.g. the highest industrial project mentioned by the coordinators ran from 2012-2014, consisted of the development of a software product named "Antiplagiat" and gained the HEI a bit more than 30.000 $) demonstrate that the amounts in general are rather low compared to professional projects elsewhere.

The peers' panel deems it desirable for the HEI to strengthen the development of the programmes (e.g. more third party funding).

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

The panel considers criterion 4 as fulfilled, however several recommendations are made in order to improve the teaching quality, research activities and subsequently the students qualifications.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module descriptions as provided in the SER

Preliminary assessment and analysis of the peers:

The peers regard the general accessibility of the module descriptions as positive: Staff and students receive up-to-date module descriptions in their internal online system ("students' office"), and they are printed in the annual module handbook. Nevertheless, the panel finds that the descriptions are often not specific enough, they are found to be too generic and including several redundancies. Overall, modules are described inconsistently, some only in Russian, some translated into English, some contain different workloads as presented in the SER, and often there is only recommended literature in Russian noted.

Furthermore, the descriptions do not continuously contain all necessary information, i.e. correct content, qualification objectives, teaching formats, admission requirements, conditions for the award of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s) of assessment and details explaining how the module mark is calculated as well as module identification codes and the date of the last amendment made. The peers find some module descriptions regarding content or aims to be identical to each other (e.g. Logical Culture of Programming has identical content and aims as System Programming and Theoretical Bases of Computer Science and Predicate Programming Methods Verification; Modern Programming Languages has identical con-

tent as Advanced Software Development…). For some modules, requirements are literally the same as the given aims and/or content (e.g. Philosophy and Political Science). This may be a problem of the process of translation only.
Some modules are not described at all (e.g. Bachelor thesis, internships) and are missing completely.

During the on-site visit peers point out the discrepancies to the HEI, discussing the necessity of transparent and complete module descriptions for all stakeholders but also for the aim of accreditation that is why they ask for thoroughly revised descriptions in the additional material (see section D). The HEI agrees in general and immediately sets out to revise the descriptions.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- samples of Diploma Certificates
- samples of Diploma Supplements
- samples of Transcript of Records

Preliminary assessment and analysis of the peers:
Shortly after graduation, a diploma or degree certificate is issued by the HEI including a transcript of records. The accompanying Diploma Supplement in English is only handed out if students ask explicitly for it as the peers learn. In order for graduates to be able to find a job internationally (also later in life, which might not be foreseeable at the time of graduation), they do need the supplements. That is why the panel criticizes the HEI's current procedure and points out that the English supplements including the Transcript of Records should be issued automatically to every graduate.

In addition, the panel analyzes the sample Diploma Supplements and comes to the conclusion that they are missing some vital information such as detailed information about the educational objectives and intended learning outcomes, the structure and the academic level of the degree programmes. The procedure manager provides the current sample of a Diploma Supplement together with the request for additional material (see section D).

Criterion 5.3 Relevant rules

Evidence:

- All relevant regulations are published in Russian only on the HEI's website: http://www.psu.kz/index.php?option=com_content&view=article&layout=edit&id=5102&lang=eng (access on November 16th, 2015)
- Appendices of the SER

Preliminary assessment and analysis of the peers:

The rights and duties of both the HEI (higher education institution) and students are clearly defined and binding, including all regulations regarding admissions. They are published in Russian (one of the main official languages of Kazakhstan) on the HEI's website as well as lists of regulatory legal acts by the Republic of Kazakhstan regarding personnel management, educational work and social affairs and so on.

The peers discuss the necessity of the relevant information being available in English or also in both languages of the degree programmes but come to the conclusion that, since all Kazakhs speak and read Russian, this one language will suffice for information and transparency as long as the HEI does not intend to inform potential international applicants. The relevant course-related information is not available on the main website for other stakeholders, but accessible for students in their individual online "student office".

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

The peers appreciate the revised module descriptions, however they still should be harmonized according to the above mentioned aspects and missing descriptions such as the Bachelor and Master thesis should be added. The peers additionally noted that the new description take different module entities than those presented in the table/graphic. It should be ensured that each module presented in the graphics has its separate module description.

The peers analyzed the additional provided Diploma Supplements and come to the conclusion that all relevant information are included.

The panel considered this criterion to be partly fulfilled.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- All relevant information regarding quality management is published on the website: http://www.psu.kz/index.php?option=com_docs&lang=eng (access on November 16th, 2015)
- SER
- On-site discussions

Preliminary assessment and analysis of the peers:

For the improvement of quality the HEI has introduced a quality management system in 2005. The peers analyze the information given by the HEI on their website and in the SER, regarding the system – including the documented Quality Policy, the issued quality objectives until 2020, the Strategic Development Plan 2011-2020 and the Quality Manual as well as documented procedures – and come to the conclusion that the quality management is developing well and implemented in the faculty. The programmes are subject to regular internal quality assessment procedures aiming at continuous improvement. All responsibilities and mechanisms defined for the purposes of continued development are binding. Students and (teaching) staff take part in the quality assurance process. The outcomes and all measures derived are made known to anyone involved, informing students through a complete feedback loop via the internal "students' office".

However, in the information provided by the HEI, the panel misses some important information such as relevant current statistical data (regarding work load, student mobility, academic feasibility etc. for the last years, e.g. 2010-2015) and asks for the additional material (see section D) to be provided by the HEI.

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

The peers highly appreciated the additional statistical data provided. The panel confirmed its preliminary analysis that this criterion was fully met.

D Additional Documents

Before preparing the final assessment, the panel asks 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:

1. Curricula presented in a structured manner
   (distinguishing/differentiating between: Informatics/Information Systems, profile/pedagogical, economic/engineering, part-time/full-time, mandatory/elective modules, please also mark those modules that are predefined by governmental regulations)
2. Revised module descriptions structured regarding the different programmes according to ASIIN template
3. Objectives-module-matrix according to ASIIN template
4. Teaching load data for each lecturer across departments (differentiated Kazakh/Russian teaching, including scientific qualification of lecturer)
5. English language sample Diploma Supplement for each programme according to current template as provided
6. Relevant statistical data 2010-2015 (students, staff, funding…)
7. Informative statistical data regarding the job situation of the Master graduates
8. Regulations for exams and all rules which have to be obeyed by the students in English language

E Comment of the Higher Education Institution (10.02.2016)

The institution provided an extensive statement as well as all requested additional documents.

F Summary: Peer recommendations (26.02.2016)

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 Informatics	with requirements	Euro-Inf®	30.09.2021
Ma Informatics	Suspension	Suspension	-
Ba Information Systems	with requirements	Euro-Inf®	30.09.2021
Ma Information Systems	Suspension	Suspension	-

For the Bachelor programmes Informatics and Information Systems:

Requirements

For all degree programmes

1. (ASIIN 1.3; 2.1) The curriculum should be revised in terms of logical sequence of modules which build on each other. Ensure that modules are presented in thematically and chronologically coherent manner.
2. (ASIIN 1.3) To enhance the professional qualification of the graduates, social competences, such as project management competences, the capacity for teamwork and communication should be fostered within the degree programmes to reach the intended learning outcomes.
3. (ASIIN 1.3, 2.1, 5.1) The module descriptions should be revised. Ensure that each module presented in the graphics has its separate module description. They should include reliable information about the content, qualification objectives, teaching formats, admission requirements/prerequisites, conditions for the award of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s)

of assessment and details explaining how the module grade is calculated as well as a module identification code and the date of the last amendment made. Missing descriptions (e.g. thesis, internships) should be added. Identical descriptions for different modules should be eliminated.

4. (ASIIN 1.3) Ensure that the presented curricula (graphics, tables) show that the modules are allocated to the core areas informatics, specialized modules in informatics and information systems, mathematics/natural science, languages and social competences. This Information should be better aligned and presented (for example with different colors) transparently to all stakeholders.

For Ba Information Systems

5. (ASIIN 2.2) Ensure that the ECTS calculation is coherent within the programme and made transparent to all stakeholders.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is highly recommended to offer elective courses where students can choose from in order to allow students to define an individual focus in their studies.

E 2. (ASIIN 1.3, 4.3) It is recommended to set up specialized and well-equipped research laboratories in order to introduce students to state of the art technologies.

E 3. (ASIIN 1.3, 4.2) It is recommended to provide lessons, advice and assistance in oral and written English to staff and students (especially with regard to publications in international journals and international professional competition).

E 4. (ASIIN 4.2) For the purpose of enabling staff to conduct research and development, it is recommended to encourage and enable staff to publish research work internationally and to implement a policy regarding sabbaticals.

E 5. (ASIIN 1.3, 4.1) It is recommended to increase research activities and ensure continuity of high quality research.

E 6. (ASIIN 4.3) It is recommended to strengthen the development of the programmes.

E 7. (ASIIN 2.2) It is recommended to support and assist students in order to gain international working or study experience.

E 8. (ASIIN 2.2, 6) It is recommended to assess the actual student workload for each module on a regular basis.

For Bachelor's degree programmes

E 9. (ASIIN 2.1) It is recommended to ensure that working practice intervals are relevant and credited.

For the Master programmes Informatics and Information Systems:

Precondition for the continuation of the accreditation procedure

1. (ASIIN 1.1; 1.3) Ensure that the qualifications profiles (qualification objectives/intended learning outcomes at programme level) and the curricula are programme-specific and distinctive thereby clarifying the acquired competences of graduates, and the intended areas of professional work in the respective programmes.
2. (ASIIN 1.3; 2.1) The curriculum should be revised in terms of logical sequence of modules which build on each other. Ensure that the modules are presented in thematically and chronologically coherent manner.
3. (ASIIN 1.3, 3) Ensure that the level of the Master thesis correspond to scientific standards of the EQF level 7.

Possible requirements for the resumption of the accreditation procedure

For Ma Information Systems

1. (ASIIN 1.3) Ensure that project management competences, the capacity for teamwork and communication are included in the curriculum in order to reach the intended learning outcomes.

For all degree programmes:

2. (ASIIN 1.3, 2.1, 5.1) The module descriptions should be revised. Ensure that each module presented in the graphics has its separate module description. They should include reliable information about the content, qualification objectives, teaching formats, admission requirements/prerequisites, conditions for the award of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s) of assessment and details explaining how the module grade is calculated as well as a module identification code and the date of the last amendment made. Missing descriptions (e.g. thesis, internships) should be added. Identical descriptions for different modules should be eliminated.

3. (ASIIN 1.3) Ensure that the presented curricula (graphics, tables) show that the modules are allocated to the core areas informatics, specialized modules in informatics and information systems as well as mathematics/natural science, languages and social competences. This Information should be better aligned and presented (for example with different colors) transparently to all stakeholders.

Possible recommendations for the resumption of the accreditation procedure

For all degree programmes

E 1. (ASIIN 1.3) It is highly recommended to offer elective courses where students can choose from in order to allow students to define an individual focus in their studies.

E 2. (ASIIN 1.3, 4.3) It is recommended to set up specialized and well-equipped research laboratories in order to introduce students to state of the art technologies.

E 3. (ASIIN 1.3, 4.2) It is recommended to provide lessons, advice and assistance in oral and written English to staff and students (especially with regard to publications in international journals and international professional competition).

E 4. (ASIIN 4.2) For the purpose of enabling staff to conduct research and development, it is recommended to encourage and enable staff to publish research work internationally and to implement a policy regarding sabbaticals.

E 5. (ASIIN 1.3, 4.1) It is recommended to increase research activities and ensure continuity of high quality research.

E 6. (ASIIN 4.3) It is recommended to strengthen the development of the programmes.

E 7. (ASIIN 2.2) It is recommended to support and assist students in order to gain international working or study experience.

E 8. (ASIIN 2.2, 6) It is recommended to assess the actual student workload for each module on a regular basis.

G Comment of the Technical Committees

Technical Committee 04-Informatics/Computer Science (15.03.2016)

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

The Technical Committee discussed the accreditation procedure and follows the assessment of the peers.

The Technical Committee deems that the qualification profiles and the curricula of the Master degree programmes as well as the level of the Master thesis do not comply with the Subject-Specific Criteria of the Technical Committee 04 - Informatics.

The Technical Committee deems, however, that the intended learning outcomes of the Bachelor degree programmes do comply with the Subject-Specific Criteria of the Technical Committee 04 - Informatics.

The Technical Committee 04 – Informatics/Computer Science recommends the award of the seals as follows:

Degree Programme	**ASIIN-seal**	**Subject-specific label**	**Maximum duration of accreditaiton**
Ba Informatics	with requirements	Euro-Inf®	30.09.2021
Ma Informatics	Suspension	Suspension	-
Ba Information Systems	with requirements	Euro-Inf®	30.09.2021
Ma Information Systems	Suspension	Suspension	-

For the Bachelor programmes Informatics and Information Systems:

Requirements

For all degree programmes

A 1. (ASIIN 1.3; 2.1) The curriculum should be revised in terms of logical sequence of modules which build on each other. Ensure that modules are presented in thematically and chronologically coherent manner.

A 2. (ASIIN 1.3) To enhance the professional qualification of the graduates, social competences, such as project management competences, the capacity for teamwork and communication should be fostered within the degree programmes to reach the intended learning outcomes.

A 3. (ASIIN 1.3, 2.1, 5.1) The module descriptions should be revised. Ensure that each module presented in the graphics has its separate module description. They should include reliable information about the content, qualification objectives, teaching formats, admission requirements/prerequisites, conditions for the award of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s) of assessment and details explaining how the module grade is calculated as well as a module identification code and the date of the last amendment made. Missing descriptions (e.g. thesis, internships) should be added. Identical descriptions for different modules should be eliminated.

A 4. (ASIIN 1.3) Ensure that the presented curricula (graphics, tables) show that the modules are allocated to the core areas informatics, specialized modules in informatics and information systems, mathematics/natural science, languages and social competences. This Information should be better aligned and presented (for example with different colors) transparently to all stakeholders.

For Ba Information Systems

A 5. (ASIIN 2.2) Ensure that the ECTS calculation is coherent within the programme and made transparent to all stakeholders.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is highly recommended to offer elective courses where students can choose from in order to allow students to define an individual focus in their studies.

E 2. (ASIIN 1.3, 4.3) It is recommended to set up specialized and well-equipped research laboratories in order to introduce students to state of the art technologies.

E 3. (ASIIN 1.3, 4.2) It is recommended to provide lessons, advice and assistance in oral and written English to staff and students (especially with regard to publications in international journals and international professional competition).

E 4. (ASIIN 4.2) For the purpose of enabling staff to conduct research and development, it is recommended to encourage and enable staff to publish research work internationally and to implement a policy regarding sabbaticals.

E 5. (ASIIN 1.3, 4.1) It is recommended to increase research activities and ensure continuity of high quality research.

E 6. (ASIIN 4.3) It is recommended to strengthen the development of the programmes.

E 7. (ASIIN 2.2) It is recommended to support and assist students in order to gain international working or study experience.

E 8. (ASIIN 2.2, 6) It is recommended to assess the actual student workload for each module on a regular basis.

For Bachelor's degree programmes

E 9. (ASIIN 2.1) It is recommended to ensure that working practice intervals are relevant and credited.

For the Master programmes Informatics and Information Systems:

Precondition for the continuation of the accreditation procedure

1. (ASIIN 1.1; 1.3) Ensure that the qualifications profiles (qualification objectives/intended learning outcomes at programme level) and the curricula are programme-specific and distinctive thereby clarifying the acquired competences of graduates, and the intended areas of professional work in the respective programmes.
2. (ASIIN 1.3; 2.1) The curriculum should be revised in terms of logical sequence of modules which build on each other. Ensure that the modules are presented in thematically and chronologically coherent manner.
3. (ASIIN 1.3, 3) Ensure that the level of the Master thesis correspond to scientific standards of the EQF level 7.

Possible requirements for the resumption of the accreditation procedure

For Ma Information Systems

A 1. (ASIIN 1.3) Ensure that project management competences, the capacity for teamwork and communication are included in the curriculum in order to reach the intended learning outcomes.

For all degree programmes:

A 2. (ASIIN 1.3, 2.1, 5.1) The module descriptions should be revised. Ensure that each module presented in the graphics has its separate module description. They should include reliable information about the content, qualification objectives, teaching formats, admission requirements/prerequisites, conditions for the award of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s) of assessment and details explaining how the module grade is calculated as well as a module identification code and the date of the last amendment made. Missing descriptions (e.g. thesis, internships) should be added. Identical descriptions for different modules should be eliminated.

A 3. (ASIIN 1.3) Ensure that the presented curricula (graphics, tables) show that the modules are allocated to the core areas informatics, specialized modules in informatics and information systems as well as mathematics/natural science, languages and social competences. This Information should be better aligned and presented (for example with different colors) transparently to all stakeholders.

Possible recommendations for the resumption of the accreditation procedure

For all degree programmes

E 1. E 1. (ASIIN 1.3) It is highly recommended to offer elective courses where students can choose from in order to allow students to define an individual focus in their studies.

E 2. E 2. (ASIIN 1.3, 4.3) It is recommended to set up specialized and well-equipped research laboratories in order to introduce students to state of the art technologies.

E 3. (ASIIN 1.3, 4.2) It is recommended to provide lessons, advice and assistance in oral and written English to staff and students (especially with regard to publications in international journals and international professional competition).

E 4. (ASIIN 4.2) For the purpose of enabling staff to conduct research and development, it is recommended to encourage and enable staff to publish research work internationally and to implement a policy regarding sabbaticals.

E 5. (ASIIN 1.3, 4.1) It is recommended to increase research activities and ensure continuity of high quality research.

E 6. (ASIIN 4.3) It is recommended to strengthen the development of the programmes.

E 7. (ASIIN 2.2) It is recommended to support and assist students in order to gain international working or study experience.

E 8. (ASIIN 2.2, 6) It is recommended to assess the actual student workload for each module on a regular basis.

Technical Committee 02– Electrical Engineering/Information Technology (18.03.2016)

Assessment and analysis for the award of the ASIIN seal:

In the first instance, the Technical Committee intensively discusses whether the reasons for recommending a suspension of the procedure for the master programmes can be considered convincing. Taking into account the peers' final statement, it concludes that the programme learning outcomes for the Master programmes – other than those for Bachelor programmes – have not been clarified satisfactorily and are essentially the same for both programmes. Furthermore, the Technical Committee understands that even assuming a distinctive and consistent underlying idea to the Master programmes, the modules appear, to a large extent, not being arranged in a logical order and thus building on each other consistently. From the perspective of the Technical Committee conditions 1 and 2 alone, which refer to these grave deficits, are justifying the proposed suspension. In addition to that, it seems that on average the final works (Master theses) do not reach the required scientific level, which apparently prompted the proposed third condition so as to assure the Master level of the graduation works. The Technical Committee consents to this assessment but cautions that it would be very difficult for the university to prove the fulfilment of this condition within the available time period solely by very few Master Theses which will have been finished by then. So, the Committee proposes to alter the wording of the condition by laying more stress on institutionalizing a set scientific standard for the final works in order to ensure its Master quality level in a sustainable manner. With these comments and the said modification, the Technical Committee agrees to the proposed recommendation regarding the suspension of the procedure for the Master programmes.

With respect to the proposed requirements and recommendations for the Bachelor programmes as well as the respective possible requirements and recommendations for the Master programmes, the Technical Committee took a closer look at requirement 4 for the Bachelor respectively 3 for the Master programmes (allocation of modules to disciplinary core areas). This requirement appears to be rather unusual. The Technical Committee takes into account that the university already presents its curricula in transparent tables/graphics and that an even stricter demand in this direction could hardly be derived from the principle of transparency as a central accreditation criterion. Provided that requirement 2 (consistent and logical sequence of modules) is properly fulfilled, there should be no further formal demand for an illustration the peers apparently wish for. Consequently, the Technical Committee argues for the deletion of this requirement.

Furthermore, the Committee suggests some minor editorial modifications to recommendations 1 (elective courses) and 3 (English language skills). Recommendations 4 and 5 are from the point of view of the Technical Committee basically aiming at the research capabilities of the university respectively the involved faculty. The two recommendations might be highlighted more convincingly if summarized in one. Consequently it is suggested to integrate recommendation 5 (research activities) into recommendation 4 (research capability of staff). Finally, the Technical Committee proposes to delete recommendation 6 (strengthening of the programmes) as self-evident and inevitable consequence of the follow-up processes of the aforementioned requirements and recommendations.

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Ba Information Systems	with requirements	Euro-Inf®	30.09.2021
Ma Information Systems	Suspension	Suspension	-

For the <u>Bachelor programmes Informatics and Information Systems</u>:

Requirements

For all degree programmes

A 1. (ASIIN 1.3; 2.1) The curriculum should be revised in terms of logical sequence of modules which build on each other. Ensure that modules are presented in thematically and chronologically coherent manner.

A 2. (ASIIN 1.3) To enhance the professional qualification of the graduates, social competences, such as project management competences, the capacity for teamwork and communication should be fostered within the degree programmes to reach the intended learning outcomes.

A 3. (ASIIN 1.3, 2.1, 5.1) The module descriptions should be revised. Ensure that each module presented in the graphics has its separate module description. They should include reliable information about the content, qualification objectives, teaching formats, admission requirements/prerequisites, conditions for the award

of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s) of assessment and details explaining how the module grade is calculated as well as a module identification code and the date of the last amendment made. Missing descriptions (e.g. thesis, internships) should be added. Identical descriptions for different modules should be eliminated.

~~A 4. (ASIIN 1.3) Ensure that the presented curricula (graphics, tables) show that the modules are allocated to the core areas informatics, specialized modules in informatics and information systems, mathematics/natural science, languages and social competences. This Information should be better aligned and presented (for example with different colors) transparently to all stakeholders.~~

For Ba Information Systems

A 5. (ASIIN 2.2) Ensure that the ECTS calculation is coherent within the programme and made transparent to all stakeholders.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is highly recommended to offer elective courses where students can choose from in order to allow students to define an individual focus in their studies.

E 2. (ASIIN 1.3, 4.3) It is recommended to set up specialized and well-equipped research laboratories in order to introduce students to state of the art technologies.

E 3. (ASIIN 1.3, 4.2) It is recommended to provide lessons, advice and assistance in oral and written English to staff and students ~~(especially with regard to publications in international journals and international professional competition)~~.

E 4. (ASIIN 1.3, 4.1, 4.2) It is recommended to increase research activities. For the purpose of enabling staff to conduct research and development, it is recommended to encourage and enable staff to publish research work internationally and to implement a policy regarding sabbaticals.

~~E 5. (ASIIN 1.3, 4.1) It is recommended to increase research activities and ensure continuity of high quality research.~~

~~E 6. (ASIIN 4.3) It is recommended to strengthen the development of the programmes.~~

E 7. (ASIIN 2.2) It is recommended to support and assist students in order to gain international working or study experience.

E 8. (ASIIN 2.2, 6) It is recommended to assess the actual student workload for each module on a regular basis.

For Bachelor's degree programmes

E 9. (ASIIN 2.1) It is recommended to ensure that working practice intervals are relevant and credited.

For the Master programmes Informatics and Information Systems:

Precondition for the continuation of the accreditation procedure

1. (ASIIN 1.1; 1.3) Ensure that the qualifications profiles (qualification objectives/intended learning outcomes at programme level) and the curricula are programme-specific and distinctive thereby clarifying the acquired competences of graduates, and the intended areas of professional work in the respective programmes.
2. (ASIIN 1.3; 2.1) The curriculum should be revised in terms of logical sequence of modules which build on each other. Ensure that the modules are presented in a thematically and chronologically coherent manner.
3. (ASIIN 1.3, 3) Ensure that the requirements for the Master thesis correspond to scientific standards of the EQF level 7.

Possible requirements for the resumption of the accreditation procedure

For Ma Information Systems

A 1. (ASIIN 1.3) Ensure that project management competences, the capacity for teamwork and communication are included in the curriculum in order to reach the intended learning outcomes.

For all degree programmes:

A 2. (ASIIN 1.3, 2.1, 5.1) The module descriptions should be revised. Ensure that each module presented in the graphics has its separate module description. They should include reliable information about the content, qualification objectives, teaching formats, admission requirements/prerequisites, conditions for the award of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s) of assessment and details explaining how the module grade is calculated as well as a module identification code and the date of the last

amendment made. Missing descriptions (e.g. thesis, internships) should be added. Identical descriptions for different modules should be eliminated.

~~A 3. (ASIIN 1.3) Ensure that the presented curricula (graphics, tables) show that the modules are allocated to the core areas informatics, specialized modules in informatics and information systems as well as mathematics/natural science, languages and social competences. This Information should be better aligned and presented (for example with different colors) transparently to all stakeholders.~~

Possible recommendations for the resumption of the accreditation procedure

For all degree programmes

E 1. (ASIIN 1.3) It is highly recommended to offer elective courses where students can choose from in order to allow students to define an individual focus in their studies.

E 2. (ASIIN 1.3, 4.3) It is recommended to set up specialized and well-equipped research laboratories in order to introduce students to state of the art technologies.

E 3. (ASIIN 1.3, 4.2) It is recommended to provide lessons, advice and assistance in oral and written English to staff and students ~~(especially with regard to publications in international journals and international professional competition)~~.

E 4. (ASIIN 1.3, 4.1, 4.2) It is recommended to increase research activities. For the purpose of enabling staff to conduct research and development, it is recommended to encourage and enable staff to publish research work internationally and to implement a policy regarding sabbaticals.

~~E 5. (ASIIN 1.3, 4.1) It is recommended to increase research activities and ensure continuity of high quality research.~~

~~E 6. (ASIIN 4.3) It is recommended to strengthen the development of the programmes.~~

E 7. (ASIIN 2.2) It is recommended to support and assist students in order to gain international working or study experience.

E 8. (ASIIN 2.2, 6) It is recommended to assess the actual student workload for each module on a regular basis.

H Decision of the Accreditation Commission (08.04.2016)

Assessment and analysis for the award of the subject-specific ASIIN seal:

The Accreditation Commission discussed the programmes. In particular, the commission intensively discussed the reasons for the suspension of the procedure for the master programmes. Taking into account the peers' final statement and the recommendations of the Technical Committees 04 and 02, it concludes that the programme learning outcomes and the curricula for the Master programmes are essentially the same for both programmes. Moreover, the Accreditation Commission understands that the modules appear, to a large extent, not being arranged in a logical order and thus building on each other consistently. In addition to that, it seems that on average the Master theses do not reach the required scientific level (EQF level 7). From the perspective of the Accreditation Commission the above mentioned grave deficits are justifying the proposed suspension.

The Accreditation Commission further discussed how the university might prove the fulfilment of the third condition within the available time period solely by very few Master theses which will have been finished by then. As a result, the Accreditation Commission follows the proposal of the Technical Committee 02 to alter the wording of the precondition by putting more emphasis on developing guidelines (in accordance to the EQF level 7) for the final Master thesis in order to ensure its Master quality level. Consequently, the third precondition for the continuation of the accreditation procedure would be fulfilled if the university provides a set of scientific standard for the Master thesis. In a second step - after the resumption of the accreditation procedure - the university will be asked to provide samples of Master theses which have been drafted following the newly developed guidelines (requirements). Therefore, the Accreditation Commission added a new requirement (see requirement A2). By dividing the procedure into two organisational parts which built up on each other the university is given a realistic time period to prove the Master level of the graduation works. With these comments and modifications, the Accreditation Commission agrees to the proposed recommendation regarding the suspension of the procedure for the Master programmes.

With respect to the proposed requirements and recommendations for the Bachelor programmes as well as the respective possible requirements and recommendations for the Master programmes, the Accreditation Commission took a closer look at requirement 4 for the Bachelor and the Master programmes (allocation of modules to disciplinary core

areas). Given the fact that the university should clearly show that the curricula are revised in terms of logical sequence of modules the illustration (graphics, tables) will demonstrate these proposed changes and this information would be presented transparently to all stakeholders. Consequently, the Accreditation Commission keeps the proposed requirement A 4.

Furthermore, the Accreditation Commission suggests some editorial modifications to the preconditions, requirements and recommendations. With regard to the recommendations 4 and 5 the Accreditation Commission follows the recommendation of the Technical Committee 02 and integrates recommendation 5 (research activities) into recommendation 4 (research capability of staff). Finally, the Accreditation Commission deletes recommendation 6 (strengthening of the programmes) as it is self-evident and an inevitable consequence of the follow-up processes of the aforementioned requirements and recommendations.

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

The Technical Committee deems that the qualification profiles and the curricula of the Master degree programmes as well as the level of the Master thesis do not comply with the Subject-Specific Criteria of the Technical Committee 04 - Informatics.

The Technical Committee deems, however, that the intended learning outcomes of the Bachelor degree programmes do 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 Informatics	with requirements	Euro-Inf®	30.09.2021
Ma Informatics	Suspension	Suspension	-
Ba Information Systems	with requirements	Euro-Inf®	30.09.2021
Ma Information Systems	Suspension	Suspension	-

For the Bachelor degree programmes Informatics and Information Systems:

Requirements

For all degree programmes

A 1. (ASIIN 1.3; 2.1) Revise the curriculum in terms of logical sequence of modules which build on each other. Ensure that modules are presented in a thematically and chronologically coherent manner.

A 2. (ASIIN 1.3) Forster social competences, such as project management competences, the capacity for teamwork and communication to enhance the professional qualification of the graduates.

A 3. (ASIIN 1.3, 2.1, 5.1) Ensure that each module presented in the graphics has its separate module description. Rewrite the module descriptions so as to include reliable information about the content, qualification objectives, teaching formats, admission requirements/prerequisites, conditions for the award of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s) of assessment and details explaining how the module grade is calculated as well as a module identification code and the date of the last amendment made. Additionally, add missing descriptions (e.g. thesis, internships) and eliminate identical descriptions for different modules.

A 4. (ASIIN 1.3) Ensure that the presented curricula (graphics, tables) show that the modules are allocated to the core areas informatics, specialized modules in informatics and information systems, mathematics/natural science, languages and social competences. This information should be better aligned and presented (for example with different colors) transparently to all stakeholders.

For Ba Information Systems

A 5. (ASIIN 2.2) Ensure that the ECTS calculation is coherent within the programme and made transparent to all stakeholders.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is highly recommended to offer elective courses where students can choose from in order to allow students to define an individual focus in their studies.

E 2. (ASIIN 1.3, 4.3) It is recommended to set up specialized and well-equipped research laboratories in order to introduce students to state of the art technologies.

E 3. (ASIIN 1.3, 4.2) It is recommended to provide lessons, advice and assistance in oral and written English to staff and students (especially with regard to publications in international journals and international professional competition).

E 4. (ASIIN 1.3, 4.1, 4.2) It is recommended to increase research activities. For the purpose of enabling staff to conduct research and development, it is recommended to encourage and enable staff to publish research work internationally and to implement a policy regarding sabbaticals.

E 5. (ASIIN 2.2) It is recommended to support and assist students in order to gain international working or study experience.

E 6. (ASIIN 2.2, 6) It is recommended to assess the actual student workload for each module on a regular basis.

For Bachelor's degree programmes

E 7. (ASIIN 2.1) It is recommended to ensure that working practice intervals are relevant and credited.

<u>For the Master degree programmes Informatics and Information Systems:</u>

Precondition for the continuation of the accreditation procedure

1. (ASIIN 1.1; 1.3) Ensure that the qualifications profiles (qualification objectives/intended learning outcomes at programme level) and the curricula are programme-specific and distinct thereby clarifying the acquired competences of graduates and the intended areas of professional work in the respective programmes.

2. (ASIIN 1.3; 2.1) Revise the curriculum in terms of logical sequence of modules which build on each other. Ensure that modules are presented in a thematically and chronologically coherent manner.

3. (ASIIN 1.3, 3) Ensure that the requirements for the Master thesis correspond to scientific standards of the EQF level 7.

Possible requirements for the resumption of the accreditation procedure

For Ma Information Systems

A 1. (ASIIN 1.3) Ensure that project management competences, the capacity for teamwork and communication are included in the curriculum in order to reach the intended learning outcomes.

For both Master degree programmes:

A 2. (ASIIN 1.3, 3) Provide Master theses which have been drafted following the newly developed guidelines (requirements).

A 3. (ASIIN 1.3, 2.1, 5.1) Ensure that each module presented in the graphics has its separate module description. Rewrite the module descriptions so as to include reliable information about the content, qualification objectives, teaching formats, admission requirements/prerequisites, conditions for the award of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s) of assessment and details explaining how the module grade is calculated as well as a module identification code and the date of the last amendment made. Additionally, add missing descriptions (e.g. thesis, internships) and eliminate identical descriptions for different modules.

A 4. (ASIIN 1.3) Ensure that the presented curricula (graphics, tables) show that the modules are allocated to the core areas informatics, specialized modules in informatics and information systems, mathematics/natural science, languages and social competences. This information should be better aligned and presented (for example with different colors) transparently to all stakeholders.

Possible recommendations for the resumption of the accreditation procedure

For all degree programmes

E 1. (ASIIN 1.3) It is highly recommended to offer elective courses where students can choose from in order to allow students to define an individual focus in their studies.

E 2. (ASIIN 1.3, 4.3) It is recommended to set up specialized and well-equipped research laboratories in order to introduce students to state of the art technologies.

E 3. (ASIIN 1.3, 4.2) It is recommended to provide lessons, advice and assistance in oral and written English to staff and students (especially with regard to publications in international journals and international professional competition).

E 4. (ASIIN 1.3, 4.1, 4.2) It is recommended to increase research activities. For the purpose of enabling staff to conduct research and development, it is recommended to encourage and enable staff to publish research work internationally and to implement a policy regarding sabbaticals.

E 5. (ASIIN 2.2) It is recommended to support and assist students in order to gain international working or study experience.

E 6. (ASIIN 2.2, 6) It is recommended to assess the actual student workload for each module on a regular basis.

I Fulfilment of Requirements (31.03.2017)

Comments of the peers and the Technical Committees (15.03.2017)

Requirements

For all programmes

A 1. (ASIIN 1.3; 2.1) Revise the curriculum in terms of logical sequence of modules which build on each other. Ensure that modules are presented in a thematically and chronologically coherent manner.

Primary Treatment	
Peers	partly fulfilled Explanation: The peers assess that the HEI still has a different understanding of the term „module" meaning in their apprehension "subdiscipline" made up of a collection of modules. Therefore, the description of the curriculum is grouped into these misconceived „modules". Additionally, the order in which the modules are offered is still in some cases unclear. The peers further detected a number of apparent translation errors that must still be corrected. They add, that it will be necessary to fully re-explain to the HEI the concept of module descriptions and the criticism of the peers in order to achieve an improvement during a third revision. Vote: majoritarian
FA 04	partly fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
FA 02	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous

A 2. (ASIIN 1.3) Forster social competences, such as project management competences, the capacity for teamwork and communication to enhance the professional qualification of the graduates.

Primary Treatment	
Peers	not fulfilled Explanation: The assessment of the peers varies in this point from fulfilled to not fulfilled. They mostly agree that the description of "Information Management" has been improved and worked on although there is still no specific project management course. However, they criticize that the provided material does not show, where the demanded social competences, e.g. teamwork, are taught and how exactly the implementation within in the modules is done. Vote: majoritarian
FA 04	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
FA 02	not fulfilled Explanation: The Committee follows the assessment of the peers

	without any changes. Vote: unanimous

A 3. (ASIIN 1.3, 2.1, 5.1) Ensure that each module presented in the graphics has its separate module description. Rewrite the module descriptions so as to include reliable information about the content, qualification objectives, teaching formats, admission requirements/prerequisites, conditions for the award of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s) of assessment and details explaining how the module grade is calculated as well as a module identification code and the date of the last amendment made. Additionally, add missing descriptions (e.g. thesis, internships) and eliminate identical descriptions for different modules.

Primary Treatment	
Peers	not fulfilled Explanation: The peers agree that the module handbook is still unclear and inconsistent still containing courses of 19 or 28 ECTS credits. Further, the structure of the module descriptions is also unclear. Consequently, the module descriptions have to be streamlined and revised. The ECTS have to be re-calculated and need to reflect the actual amount of work. Vote: majoritarian
FA 04	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
FA 02	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous

A 4. (ASIIN 1.3) Ensure that the presented curricula (graphics, tables) show that the modules are allocated to the core areas informatics, specialized modules in informatics and information systems, mathematics/natural science, languages and social competences. This information should be better aligned and presented (for example with different colors) transparently to all stakeholders.

Primary Treatment	
Peers	Partly fulfilled Explanation: In the assessment of the documents on this requirement the peers quite disagree. Generally they concur that that the university has not provided all the information asked for although

	the modules have been marked with regard to the core areas (CMN - courses of mathematical and natural sciences; SC – special; courses; DSK - deepening of special knowledge; EIC - external and intersubject contents; PP - Professional Practice, FE - Final Examination). However, they are still missing the specific marking for "languages and social competences". In consequence, they consider this criterion as partly fulfilled. Vote: majoritarian
FA 04	partly fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
FA 02	fulfilled Explanation: The Committee judges the requirement as fulfilled satisfactorily, since the university apparently provided graphical illustrations of the curricula largely fulfilling the expectations of the expert panel. Vote: unanimous

For Ba Information Systems

A 5. (ASIIN 2.2) Ensure that the ECTS calculation is coherent within the programme and made transparent to all stakeholders.

Primary Treatment	
Peers	Not fulfilled Explanation: The peers very much disagree on this point. Apparently, the HEI has marked most modules with a transparent indication of the workload (30hrs per ECTS). Nevertheless, some of the peers question how the numbers are calculated since the HEI does not provide any information on the calculation process. Therefore, the indicated ECTS-credits often seem to be an arbitrary distribution which needs to be re-worked. Vote: majoritarian (2 fulfilled vs. 3 not fulfilled)
FA 04	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
FA 02	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous

Decision of the Accreditation Committee (31.03.2017)

Assessment: The Accreditation Committee follows the recommendations given by the peers and the Technical Committees and considers the requirements 1, 2, 3 and 5 as not yet fulfilled.

The Accreditation Committee decides to extend the label award as follows:

Studiengang	**ASIIN-Siegel**	**Fachlabel**	**Akkreditierung bis max.**
Ba Informatics	Requirements 1, 2, 3 and 5 not fulfilled	Euro-Inf®	30.09.2021 (prolongation of six months)
Ba Information Systems	Requirements 1, 2, 3 and 5 not fulfilled	Euro-Inf®	30.09.2021 (prolongation of six months)

J Fulfilment of Requirements (29.09.2017)

Comments of the peers and the Technical Committees (15.03.2017)

Requirements

For all degree programmes

A 1. (ASIIN 1.3; 2.1) Revise the curriculum in terms of logical sequence of modules which build on each other. Ensure that modules are presented in a thematically and chronologically coherent manner.

Initial Treatment	
Peers	partly fulfilled Explanation: The peers assess that the HEI still has a different understanding of the term „module" meaning in their apprehension "subdiscipline" made up of a collection of modules. Therefore, the description of the curriculum is grouped into these misconceived „modules". Additionally, the order in which the modules are offered is still in some cases unclear. The peers further detected a number of apparent translation errors that must still be corrected. They add, that it will be necessary to fully re-explain to the HEI the concept of module descriptions and the criticism of the peers in order to achieve an improvement during a third revision. Vote: majoritarian
TC 04	partly fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
TC 02	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
AC	not fulfilled Vote: unanimous Justification: The Accreditation Committee agrees with the assessment of the peers and the Technical Committees
Secondary Treatment	
Peers	No consensual vote: Justification A (not fulfilled): The university provides information about horizontal and vertical placement of their modules, but the key question was to present the respective modules not as a list, but really place them (in a table) in a clear and meaningful way

	Justification B (partly fulfilled): Although description of modules has improved there is still a misconception of module (subdiscipline) leading to 'huge' modules (e.g." Basic Principles of Software Development". Justification C (fulfilled): The curriculum is divided into 13 blocks called "modules", what we call module is named "academic discipline". The tables, however, show each module (in our understanding) with respect to semester and length. From this one can get a reasonable understanding about the structure of the programmes which is not that different from European standards. The descriptions in the handbooks, however, treat each block as a whole which for large blocks requires more work for the reader to get the information about each module. The information given itself is okay. The block "Organization and Management of Computer Systems" is still questionable because of its disciplines OS, architecture, but also Theoretical Mechanics and Theory of Languages and Automata. These minor points could be improved, however the basic requirement of a sound curriculum is clearly fulfilled.
TC 04	fulfilled Vote: per majority Justification: The peers in their majority follow the positive assessment of one of the peers. They are of the opinion, that the HEI has produced sufficient documentation of their improvements.
TC 02	fulfilled Vote: unanimous Justification: The peers in their majority follow the positive assessment of one of the peers. They are of the opinion, that the HEI has produced sufficient documentation of their improvements.

A 2. (ASIIN 1.3) Foster social competences, such as project management competences, the capacity for teamwork and communication to enhance the professional qualification of the graduates.

Initial Treatment	
Peers	not fulfilled Explanation: The assessment of the peers varies in this point from fulfilled to not fulfilled. They mostly agree that the description of "Information Management" has been improved and worked on although there is still no specific project management course. However, they criticize that the provided material does not show,

	where the demanded social competences, e.g. teamwork, are taught and how exactly the implementation within in the modules is done. Vote: majoritarian
TC 04	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
TC 02	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
AC	not fulfilled Vote: unanimous Justification: The Accreditation Committee agrees with the assessment of the peers and the Technical Committees
Secondary Treatment	
Peers	No consensual vote: Justification A (not fulfilled): the university provided the peers with a module description of a course called "**Module of Social and Ethical Competencies**". This was only part of their criticism. The main criticism went into the direction of how such social competences are built into courses (e.g. project courses where you distribute tasks among students and foster project management skills). So the issue remains: Can the university clearly show where and they train project management skills? Justification B (partly fulfilled): The University in its statement states that project management is handled in the frame of various courses (e.g. "Programming languages and technologies", "Organization and management of computer systems", "Networks and communications"). The peers question why project management (skills) are then not mentioned in the respective module description under "Module objectives /intended learning outcomes"? The "ability to work in a team" is a social competency but not project management. Justification C (fulfilled): There has been a significant improvement now mentioning these issues in the descriptions explicitly, even with respect to project management. The "module" programming now contains: Seminar-style lesson with practice exercises. Method of projecting is used, which is assigned for groups of more than 5 students, as well as term paper compilation.
TC 04	fulfilled

	Vote: unanimous Justification: The peers in their majority follow the positive assessment of one of the peers. They are of the opinion, that the HEI has produced sufficient documentation of their improvements.
TC 02	fulfilled Vote: unanimous Justification: The peers in their majority follow the positive assessment of one of the peers. They are of the opinion, that the HEI has produced sufficient documentation of their improvements. However, it is suggested to indicate that the enhancement of the students' social competences will be thoroughly checked in the course of the reaccreditation procedure.

A 3. (ASIIN 1.3, 2.1, 5.1) Ensure that each module presented in the graphics has its separate module description. Rewrite the module descriptions so as to include reliable information about the content, qualification objectives, teaching formats, admission requirements/prerequisites, conditions for the award of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s) of assessment and details explaining how the module grade is calculated as well as a module identification code and the date of the last amendment made. Additionally, add missing descriptions (e.g. thesis, internships) and eliminate identical descriptions for different modules.

Initial Treatment	
Peers	not fulfilled Explanation: The peers agree that the module handbook is still unclear and inconsistent still containing courses of 19 or 28 ECTS credits. Further, the structure of the module descriptions is also unclear. Consequently, the module descriptions have to be streamlined and revised. The ECTS have to be re-calculated and need to reflect the actual amount of work. Vote: majoritarian
TC 04	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
TC 02	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
AC	not fulfilled Vote: unanimous Justification: The Accreditation Committee agrees with the assess-

	ment of the peers and the Technical Committees
Secondary Treatment	
Peers	fulfilled Justification: The module descriptions have significantly improved, however, some modules (subdisciplines) have still a very high ECTS score e.g. “Organization and Management of Computer Systems”, “Pro-gramming Languages and Technologies”.
TC 04	fulfilled Vote: unanimous Justification: The TC agrees with the assessment of the peers.
TC 02	fulfilled Vote: unanimous Justification: The TC agrees with the assessment of the peers.

For the Bachelor Information Systems programme

A 4. (ASIIN 2.2) Ensure that the ECTS calculation is coherent within the programme and made transparent to all stakeholders.

Initial Treatment	
Peers	Not fulfilled Explanation: The peers very much disagree on this point. Apparent-ly, the HEI has marked most modules with a transparent indication of the workload (30hrs per ECTS). Nevertheless, some of the peers question how the numbers are calculated since the HEI does not provide any information on the calculation process. Therefore, the indicated ECTS-credits often seem to be an arbitrary distribution which needs to be re-worked. Vote: majoritarian (2 fulfilled vs. 3 not fulfilled
TC 04	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
TC 02	not fulfilled Explanation: The Committee follows the assessment of the peers without any changes. Vote: unanimous
AC	not fulfilled Vote: unanimous Justification: The Accreditation Committee agrees with the assess-ment of the peers and the Technical Committees
Secondary Treatment	
Peers	fulfilled

	Justification: The calculation on the basis of hours is a commonly used practice, at least when there are no more quantitative facts (given the history of the degree programs) to support the calculation. Hence, the peers conclude that a coherent calculation is no ensured.
TC 04	fulfilled Vote: unanimous Justification: The TC agrees with the assessment of the peers.
TC 02	fulfilled Vote: unanimous Justification: The TC agrees with the assessment of the peers.

K Decision of the Accreditation Committee (29.09.2017)

Assessment: The Accreditation Committee considers the remaining requirements to be fulfilled.

The Accreditation Committee decides to award the labels as follows:

Degree Programme	ASIIN-Label	Subject-specific Label	Accreditation until max.
Ba Informatics	Requirements fulfilled	Euro-Inf®	30.09.2021
Ba Information Systems	Requirements fulfilled	Euro-Inf®	30.09.2021

L Resumption of the Master degree programmes Ma Informatics and Ma Information Systems

Assessment of the peers and the Technical Committees:

Preconditions

For all degree programmes

A 1. (ASIIN 1.1; 1.3) Ensure that the qualifications profiles (qualification objectives/intended learning outcomes at programme level) and the curricula are programme-specific and distinct thereby clarifying the acquired competences of graduates and the intended areas of professional work in the respective programmes.

Initial Treatment	
Peers	fulfilled Justification: The HEI has now distinguished the different pro-

	grammes sufficiently, although the peers underline that there is still room for improvement Vote: unanimous
TC 02	fulfilled Vote: unanimous Justification: The TC agrees with the assessment of the peers
TC 04	fulfilled Vote: unanimous Justification: The TC agrees with the assessment of the peers

A 2. (ASIIN 1.3; 2.1) Revise the curriculum in terms of logical sequence of modules which build on each other. Ensure that modules are presented in a thematically and chronologically coherent manner.

Initial Treatment	
Peers	Fulfilled (2)/partly fulfilled (1) Justification: The HEI has re-arranged the courses so that they are in logical order, except for starting with research work before appropriate methods are taught. Possibly, this is included in the module "research work" in the 1st semester- but then it should be explicitly stated. Both peers agree in this assessment but judge it slightly different Vote: split
TC 02	fulfilled (sufficiently for 1 year requirement) Vote: unanimous Justification: The TC is unable to assess whether students actually do have relevant methodical competences in the first semester in order to meaningfully conduct research work. Since apparently no module descriptions have been submitted along with the report of the fulfillment of the preconditions, the HEI would have at least to provide the module description for this course in order to get a reliable basis for a final assessment. The Technical Committee proposes to judge the precondition as already sufficiently fulfilled for the resumption of the procedure. As the HEI didn't provide any material with regard to the possible requirements, these will automatically become actual requirements. Thus, the HEI will be forced inter alia to present revised module descriptions (A 3), which will offer the opportunity to re-assess in one year's time whether the allocation of the "research work" course in the first semester is appropriate
TC 04	fulfilled Vote: unanimous Justification: The TC agrees in its assessment with the opinion of the majority of the peers.

A 3. (ASIIN 1.3, 3) Ensure that the requirements for the Master thesis correspond to scientific standards of the EQF level 7.

Initial Treatment	
Peers	fulfilled Justification: The HEI has now specified appropriate criteria for the evaluation/grading of a thesis. But it has to be proven eventually by sample theses, that the criteria are being applied. Vote: unanimous
TC 02	fulfilled Vote: unanimous Justification: The TC agrees with the assessment of the peers
TC 04	fulfilled Vote: unanimous Justification: The TC agrees with the assessment of the peers

MDecision of the Accreditation Committee (29.09.2017)

The Accreditation Committee agrees with the positive assessment of the peers considering the preconditions to be fulfilled.

The Accreditation Committee decides to award the labels as follows:

Degree programme	**ASIIN-label**	**Subject-specific label**	**Accreditation until max.**
Ma Informatics	All preconditions fulfilled; With requirements for one year	Euro-Inf®	30.09.2022

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ma Information Systems	All preconditions fulfilled; With requirements for one	Euro-Inf®	30.09.2022

Requirements

For Ma Information Systems

A 1. (ASIIN 1.3) Ensure that project management competences, the capacity for teamwork and communication are included in the curriculum in order to reach the intended learning outcomes.

For all degree programmes:

A 2. (ASIIN 1.3, 2.1, 5.1) The module descriptions should be revised. Ensure that each module presented in the graphics has its separate module description. They should include reliable information about the content, qualification objectives, teaching formats, admission requirements/prerequisites, conditions for the award of credits, ECTS credits and grades, frequency of offer, workload and duration of each module, form(s) of assessment and details explaining how the module grade is calculated as well as a module identification code and the date of the last amendment made. Missing descriptions (e.g. thesis, internships) should be added. Identical descriptions for different modules should be eliminated.

A 3. (ASIIN 1.3) Ensure that the presented curricula (graphics, tables) show that the modules are allocated to the core areas informatics, specialized modules in informatics and information systems as well as mathematics/natural science, languages and social competences. This Information should be better aligned and presented (for example with different colors) transparently to all stakeholders.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is highly recommended to offer elective courses where students can choose from in order to allow students to define an individual focus in their studies.

E 2. (ASIIN 1.3, 4.3) It is recommended to set up specialized and well-equipped research laboratories in order to introduce students to state of the art technologies.

E 3. (ASIIN 1.3, 4.2) It is recommended to provide lessons, advice and assistance in oral and written English to staff and students (especially with regard to publications in international journals and international professional competition).

E 4. (ASIIN 4.2) For the purpose of enabling staff to conduct research and development, it is recommended to encourage and enable staff to publish research work internationally and to implement a policy regarding sabbaticals.

E 5. (ASIIN 1.3, 4.1) It is recommended to increase research activities and ensure continuity of high quality research.

E 6. (ASIIN 4.3) It is recommended to strengthen the development of the programmes.

E 7. (ASIIN 2.2) It is recommended to support and assist students in order to gain international working or study experience.

E 8. (ASIIN 2.2, 6) It is recommended to assess the actual student workload for each module on a regular basis.

Appendix: Programme Learning Outcomes and Curricula

According to the self evaluation report (SER) the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor degree programmes (no differentiation between Ba Informatics and Ba Information Systems):

"Education programs (hereinafter – EP) of bachelors are focused on preparation on the questions, connected with modern information technologies in use of computer systems, software programming languages, the software for the solution of various tasks in the field of design, development and administration of information systems databases and masters in the solution of applied professional problems of informatics in the development field, introduction of innovative projects in the IT-sphere. Graduates are prepared for work in the areas using methods of applied mathematics and computer technologies, development of requirements and specifications of separate components of objects of professional activity on the basis of inquiries of users, models of subject area and opportunities of technical means.

Qualification and positions of graduates are defined according to "The qualification reference book of positions of heads, experts and other employees" by the approved order of the Minister of Labour and Social Protection of the Republic of Kazakhstan."

The objectives of education programs 5B060200 - «Informatics», 5B070300 – «Information systems»

Code of the obj	Objective Description
5B060200 - «Informatics»	
Obj 1	To teach students the fundamental concepts of computer science, to give knowledge about trends and perspective directions in computer science, the modern means of computer technology, and telecommunications;
Obj 2	Providing graduates with initial knowledge and experience necessary to start a profession of engineer-programmer; Programmer (webmaster, web designer); Information Security;
Obj 3	Training students to analyze, select and apply software development technologies and tools for the development of technical specifications in the innovative envi-

	ronment;
Obj 4	Training all the students at sufficient level for future professional and academic career.
	5B070300 – «Information Systems»
Obj 1	To teach students the fundamental concepts of design, development and management of information systems
Obj 2	Providing graduates with initial knowledge and experience necessary to start a profession of programmer, developer and administrator of information systems
Obj 3	To teach students efficient use of information technology, as well as modern methods, tools and techniques of information systems design in solving professional problems
Obj 4	Training all the students at sufficient level for future professional and scientific work.

Furthermore, the SER reads:

“For a competent and executive decision of professional tasks bachelors have to:

have an idea of:

- of modern latest developments in the field of information technologies, of ways and means of improvement of computer technologies, the software, information systems, of modern requirements of labor market;

to know:

- about prospects and development trends of information technologies;

- models and methods of disciplines of subject areas of information systems, namely: economy, finance, management and other components activity business in the organizations;

- modern computer aids, communications and telecommunication;

- modern models, methods and design technologies of information systems;

- methods and management techniques, formation and implementation of information systems in business activity of the organizations;

- technologies of interpersonal communication and group work, work management in team operation;

- rules, methods and means of preparation of technical documentation;

- principles of economics, organizations of production and scientific researches, principles of labour legislation, ergonomics;

- state resolutions, instructions, orders, standards, standards, mathematical models, methods, ways and design technology, development, production, introduction and support of information systems and networks;

- analysis methods and performance evaluation of development, introduction and functioning of information system;

- foreign experience in the selected direction of activity.

to be able:

- freely to analyze studied object and to find a decision method, and also own and foreign experience of development and deployment of information systems;

- to use system concepts for understanding and problems definition;

- to program with use of state-of-the-art tools;

- to form technical documentation on developed information system;

- to solve problems based on the fact that the systems consist of people, procedures, hardware, software and data;

- on scientific basis to organize the work, using the knowledge of ergonomics;

- to apply modern latest developments in the field of information technologies in the sphere of professional activity, to study special literature and other scientific and technical information, achievements of native and foreign science and equipment in the field of the professional activity;

to have skills:

– work with hardware and software and hardware complexes of information systems and soft-ware;

– professional search of necessary information in the Internet, scientific and periodic literature;

– selecting the architecture and hardware integration of information systems;

– design of information systems and their elements in concrete areas;

to be competent:

on all questions, connected with modern information technologies: in use of computer systems, software programming language, the software for the solution of various tasks and stages of technological process, safety of work in production, environment protection"

Furthermore, the SER adds:

"As a result of training on educational programs bachelors have to possess culture of thinking, know its general laws, to be capable in written and oral speech, correct and logical to issue its results, the know ethical and the rules of law governing the relation of the person to the person, society, environment, principles of the economic analysis and to be ready to performance of organizational and administrative functions in collective and to own system of knowledge of formation and application of modern technologies in the subject area, and also in adjacent areas.

As a result of training on educational programs bachelors have to:

- to have experience in various types of computer systems, be able to apply algorithmic languages, approximate methods and standard software for applications, software packages and databases, in computer graphics, expert systems and knowledge bases;

- to know modern computer aids, telecommunications and communication;

- to know the prospects and IT development trends;

- has to be able to improve of the professional activity in the field of informatics;

- to study special literature and other scientific and technical information, achievements of native and foreign science and equipment in the field of the professional activity;

Professional opportunities of the bachelor in modern conditions have to conform to requirements of a global international labor market. The bachelor has to be ready to change of social, economic, professional roles, has to be geographically and is socially mobile in the conditions of accruing dynamism of changes and uncertainties.

Graduates can carry out the following types of professional activity: research, production and technological, design, organizational and administrative, operational and educational."

:

The following **curriculum** is presented for the Bachelor Informatics

5B060200 Informatics **full-time**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
semestr																														
1	History of Kazakhstan					Informatics					Kazakh/Russian language					Foreign language					Analitical geometry and linear algebra					Programming languages and technologies				
2	Politology			Sociology			Ecology and sustainable development				Kazakh/Russian language					Foreign language					Data Structures and Algorithms					Mathematical analysis				
3	Philosophy					Elementary economics				Law basics			Mathematical analysis 2\ Additional chapters of mathematical analysis				Object-oriented programming\ C++ programming				Differential equations					Mathematical foundation of informatics\ Queueing theory				
4	Basics of personal and social safety			Numerical computing\ Parallel computing						Java Programming\ Modern programming languages					Research language and style\Scientific basics of informatics				Proffesional Kazakh language		Profession-oriented foreign language			Discrete mathematics		Field internship		
5	Physics\ theoretical mechanics					PROLOG Programming\LISP Programming					Operating systems\Optimisation methods and operations study					Data systems engineering\ Intelligent information systems					Theory of languages and automats					Data base theory				
6	Architecture of computer systems\ Basics of simulation modelling					Basics of computer modelling\ Man-machine interaction					Computer nets\ Communicative nets and systems					Web - technologies\ Programming for Internet					Computer graphics/web design			Design and development of multimedia systems\ Design of multimedia applications					
7	Industrial informatics\Design of e-books						Mobile application development\ Business application development						Predicate programming and modern methods of programs verification\ Verification and validation of programming products					IT security and data protection\ Data protection in computer nets					1C platform programming technology\ New information technologies					
8	Work experience internship										Pre-graduation internship						State examination in specialty					Graduation paper presentation							

General disciplines

Basic disciplines / Compulsory component

Basic disciplines / Optional component

Majors/ Compulsory Component

Majors / Optional component

The following **curriculum** is presented for the Bachelor Information Systems:

B070300 - Information Systems Teaching Program (full form)

	ECTS																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	The History of Kazakhstan					Informatics					Kazakh/Russian Language					Foreign Language					Algebra and Geometry					C++ programming/ Programming languages and technologies			
2	Sociology			Kazakh/ Russian Language				Foreign Language				Law Basics			Mathematical Analysis			Algorithms, data structures and programming			Information Systems Basics					Field internship			
3	Politology			Philosophy					Mathematical Analysis 2/ Additional chapters of mathematical analysis			Theory of Probability and Mathematical Statistics					Physics					Professional Kazakh(Russian) Language					Object - oriented programming/ Technology of programming			
4	Elementary Economics			Health and Safety			Ecology and Sustainable development			Professionally-oriented Foreign Language			Basics of Scientific Research/ Scientific basics of informatics			Databases in IS			Computer graphics / Engineering graphics				Information Systems Design / Intellectual informational systems				Work experience internship		
5	Numerical Methods/ Theory of optimisation theory					Multimedia technology / Media technology					Web technology/ Programming for Internet						Java programming / Modern programming languages				Information Systems Modeling/ Man-machine interaction					Computer networks/ Communicative nets and systems			
6	Programming in Prolog/ LISP Programming						Mobile Application Development / Tools for building mobile applications						Information Security and Information Protection / Defence of information is in computer networks				Information Technology of Experimental Data Processing **(for the information systems in Engineering)** / Accounting and Auditing (f**or the information sys-**				Industrial Computer Science (for the information systems in Engineering) / 1C-Based Programming Technology or the information systems					Work experience internship		

				tems in the Economy)	in the Economy) (**for the informative systems in an economy)**	
7	Fundamentals of computer modeling/ Basics of imitative modelling	Modern methods of programs verification/ Verification and validation of programming products	Computer-aided Design Tools (for the information systems in Engineering) / **Software of economic calculations (or the information systems in the Economy)**		The Development of Industrial Information Systems (for the information systems in Engineering) / **The Development of Business Applications in Economy (or the information systems in the Economy)**	
8	Pre-graduation internship			State examination in specialty	Graduation paper presentation	

general disciplines
Basic disciplines – compulsory component
Basic disciplines – optional component
Majors – compulsory component
Majors - optional component

There is no information on **objectives and learning outcomes** (intended qualifications profiles) **published in English** for the degree programmes Master of Informatics and Master of Information Systems on the department's website.

According to the additional documentation the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master degree programmes:

"Training in masters program is conducted in two directions: scientific-pedagogical and profile.

The main objectives of an education program by profile preparation consist in formation of conditions for receiving profound knowledge in the field of fundamental principles of informatics and information systems; possibility of a choice of individual programs in the field of education and professional competence; personnel training for branches of economy, business, the information technologies possessing profound vocational training.

The main objectives of an educational program by scientific and pedagogical preparation:

- profound theoretical and practical preparation in the selected direction of science and pedagogical activity;

- development of ability to self-improvement and self-development, requirement and skills of independent creative mastery new knowledge during all their dynamic activity;

- training of specialists with high level professional culture, including cultures of the professional communication, having the civic position, capable to formulate and solve modern scientific and practical problems, to teach in higher education institutions, successfully to carry out research and administrative activity;

- skills acquisition of the organization and carrying out scientific researches, receiving a necessary reserve for continuation of scientific work in doctoral studies;

- acquiring of knowledge in the field of high school pedagogic and psychology and experience of teaching in higher education institution."

The objectives of Master's programs

	6M060200 - «Informatics»	
	Scientific and pedagogical direction	**Profile direction**
Obj 1	Preparing graduate students to research structures, characteristics and possibilities of describing information and its processing, as well as methods and construction principles of computer systems..	Preparing graduate students to research structures, characteristics and possibilities of describing information and its processing, as well as methods and construction principles of computer systems..
Obj 2	Preparing graduate students for pedagogical work: preparation for the training sessions in the educational institutions, the development and introduction of the latest computer technologies into educational process, development of teaching materials based on modern methods, tools and technologies.	
Obj 3	Preparing graduate students for conducting research and experimental work with the application necessary methods and control, monitoring, and analysis tools.	
Obj 4	Preparing graduate students for self education and mastering new professional knowledge and skills, continuous professional improvement, development of the ability of graduates of the program to adapt to any new computer	

	systems, due to the rapid progress in this area.	
	6M070300 - «Information Systems»	
	Scientific and pedagogical direction	**Profile direction**
Obj 1	Preparing graduate students of engineering, information systems implementation and management in accordance with the requirements of the market and branches.	Preparing graduate students of engineering, information systems implementation and management in accordance with the requirements of the market and branches.
Obj 2	Preparing graduate students for pedagogical work: preparation for the training sessions in educational establishments, design, and development of information systems for the education system.	
Obj 3	Preparing graduate students for conducting research and experimental work with the application necessary methods and control, monitoring, and analysis tools.	
Obj 4	Preparing graduate students for the self education and mastering new professional knowledge and skills and continuous professional self-improvement	

The following **curriculum** is presented for the Master Informatics:

	ECTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
semestr	1	History and Philosophy of Science				Foreign Language (Professional)				Pedagogics				The Kazakh Language for Specific Purposes / A culture of speech				Methods of Teaching IT-Disciplines in Higher Education Institutions / Questions of implementation and use of modern learning technologies					Industrial Informatics / Fundamentals of Robotics						Research work			
	2	Psychology				Software Development Technologies				Information and Mathematical Methods of Web Site Design/ Computer Networks, Internet and multimedia technologies				Scientific Research Methodology /Experimental methods for processing scientific information				Mobile and Cloud Computing / Parallel Programming					Pedagogical practice			Research work		Research practice			
	3	Human-computer interaction/ Usability software interface				Project management and teamwork / Project Planning				Controllers and Simulators / Sensors in electronic devices				Economic and Information Security / Cryptology				IT-Infrastructure Management / Infrastructure Information Systems					Research work								
	4	Research practice				Research work												Complex examination in the specialty					Registration and protection of the master's thesis								

Basic subjects / compulsory

Core subjects / compulsory

Basic disciplines / Optional component

Core subjects / Optional component

Research work, Complex exam, Master's thesis

Practice

The following **curriculum** is presented for the Master Information Systems:

Graphic representation of the curriculum for the Master Information Systems

семестр	кол-во ECTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	1	History and Philosophy of Science				Foreign Language (Professional)				Pedagogics				Psychology				The Kazakh Language for Specific Purposes / A culture of speech				Theory and Specification of Programming / Algorithms and their complexity						Research work			
	2	Architecture of Information Systems				Object-Oriented Programming in Java / IS Development Technologies				Methods of Teaching IT-Disciplines in Higher Education Institutions / Questions of implementation and use of modern learning technologies				Scientific Research Methodology /Experimental methods for processing scientific information				Mobile and Cloud Computing / Parallel Programming				Pedagogical practice		Research work		Research practice			
	3	Object Oriented Business Modeling, Systems Analysis and Design / IS Management				Modeling Knowledge Base of Intelligent Information Systems / Analysis and modeling of information processes				Controllers and Simulators / Sensors in electronic devices				Industrial Networking Standards / Mathematical modeling of computer networks				Industrial Informatics / Fundamentals of Robotics						Research work					
	4	Research practice								Research work										Complex examination in the specialty						Registration and protection of the master's thesis					

Basic subjects / compulsory	Basic disciplines / Optional component	Research work, Complex exam, Master's thesis	
Core subjects / compulsory	Core subjects / Optional component	Practice	