ASIIN Seal & Euro-Inf Label

Accreditation Report

Bachelor's Degree Programme
Information Systems and Technology

Master's Degree Programme
Informatics and Computer Technology

Provided by
Saint-Petersburg State University of Aerospace Instrumentation (SUAI)

Version: 07 December 2021

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Информационные системы и технологии - Информационные технологии в дизайне	Information systems and technology - Information technology in design	ASIIN, Euro-Inf® Label	/	04
Информатика и вычислительная техника - Встроенные системы обработки информации и управления	Informatics and computer technology - Embedded systems for information processing and control	ASIIN, Euro-Inf® Label	/	04
Date of the contract: 05.03.2021 **Submission of the final version of the self-assessment report:** 06.08.2021 **Date of the visit:** 14.-15.09.2021 **Online**				
Peer panel: Prof. Dr. Vera Meister, Brandenburg University of Applied Sciences Prof. Dr. Thomas Meuser, Niederrhein University of Applied Sciences Jan Froese, Kühne + Nagel Antonia Vitt, Student at University of Siegen				
Representative of the ASIIN headquarter: Sophie Schulz				
Responsible decision-making committee: Accreditation Commission				

[2] TC: Technical Committee for the following subject areas: TC 04 - Informatics/Computer Science

Criteria used: European Standards and Guidelines as of May 15, 2015 ASIIN General Criteria, as of December 10, 2015 Subject-Specific Criteria of Technical Committee 04 – Informatics/Computer Science as of March 29, 2018	

B Characteristics of the Degree Programmes

a) Name	Final degree (original/ English translation)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Information Systems and Technology	Бакалавр, Bachelor of Engineering (B.Eng.)	Information technology in design	6	Full time	-	8 semesters	240 credit points	Fall 2011
Informatics and Computer Technology	Магистр, Master of Engineering (M.Eng)	Embedded systems for information processing and control	7	Full time	-	4 semesters	120 credit points	Fall 2016

For the Bachelor's degree programme Information Systems and Technology the institution has presented the following profile in the self-assessment report:

„The main spheres of the professional activity of the Bachelor degree program graduates include: information systems and technology, software for information systems, databases and storages of information, networks and telecommunications, projects in the field of information technology, technical documentation in the field of information technology, interfaces of information systems.

Objectives of the bachelor programme are to train experts:

- who master modern methods of development, modification and support of information systems, design of information technology and resources meeting the quality standards;
- who can analyse problems and requirements, offer effective means of solving set task;
- who can manage projects on creation of information systems and technologies, demonstrating skills of conceptual, analytical and logical thinking;
- who can independently acquire and use mathematical, natural science, social-economic and professional knowledge, demonstrating aspiration to life-long learning;

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

- who demonstrate communication skills, including in a foreign language, who are able to consider cultural diversity in the process of intercultural interaction."

For the Master's degree programme Informatics and Computer Technology the institution has presented the following profile in the self-assessment report:
„The programme allows students getting an occupation associated with state-of-the-art technologies, being demanded experts in the market of this area and developing their research skills obtained in the process of study.

Objectives of the master programme are to train Masters who will be able to:

- make critical analysis of problem situations based on the system approach, elaborate action strategy;
- manage a project at all stages of its lifecycle, organize and lead teamwork developing a team strategy to reach a set goal;
- use modern communication technologies including those in foreign language(s) for academic and professional interaction;
- define and implement priorities of their own activity and means of its upgrading based on self-esteem;
- independently acquire, develop and use mathematical, natural science, social-economic and professional knowledge to solve non-textbook tasks including those in a new or unknown environment and in the interdisciplinary context;
- develop original algorithms and software including use of modern intelligent technologies to solve professional tasks;
- analyse professional information, highlight the main provisions, structure, formulate and represent in the form of analytical reviews with substantiated conclusions and recommendations;
- develop and update software and hardware of information and automated complexes and systems;
- adapt foreign complexes of information processing and automated design to the needs of national enterprises;
- integrate and endorse the developed software, computing systems, communication equipment; develop means and systems of information protection of automated systems;
- conduct synthesis of a logical scheme in the basis of a selected technological library based on set time and physical limitations using means of automated design;
- develop methods of implementation of analytical works and apply new scientific principles and research methods;
- provide scientific supervision in the corresponding field of knowledge."

C Peer Report for the ASIIN Seal[4]

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Self-Assessment Report
- Website per programme
- Objective-module-matrices
- Discussions during the audit

Preliminary assessment and analysis of the peers:

For the two study programmes, the Saint-Petersburg State University of Aerospace Instrumentation (SUAI) has described and published program objectives and program learning outcomes that are listed under chapter B of this report. The documents for both programmes are accessible to everyone via the website. The peers refer to the general criteria of ASIIN and the subject-specific criteria of ASIIN's Technical Committee 04 – Informatics/Computer Science in order to judge whether the intended learning outcomes of both study programmes, as defined by SUAI, correspond with the competencies as outlined by the above-mentioned criteria.

They agree that the described learning outcomes of Bachelor's program adequately reflect level 6 of the European Qualification Framework (EQF) while those of the Master's program correspond to the requirements of EQF level 7 programs. The program objectives and learning outcomes of both programs are consistent with the general criteria of ASIIN and the subject-specific criteria of the above-mentioned technical committee. The objectives and learning outcomes aim at the acquisition of specific competences and are described in a brief and concise way. They are well-anchored, binding and easily accessible to all stakeholders. The peers acknowledge that various stakeholders, both national and international, are involved in the constant review and development of the curricula and that SUAI holds very close collaborations with influential companies. The industry representatives confirm

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

that they play a crucial role when it comes to the definition and adaptation of program objectives (and thus the curricula). In doing so, SUAI takes into account both scientific and technical progress as well as the (partly fast changing) needs of the Russian labour market.

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
The peers consider the names of the study programmes to be adequately reflecting the respective aims, learning outcomes and curricula.

Criterion 1.3 Curriculum

Evidence:

- Competency Matrices for both degree programmes
- Module handbooks for both degree programmes
- Curricula for both degree programmes
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

To reach the intended learning outcomes, both curricula include compulsory and elective modules, practical parts, course projects and a Bachelor's or Master's thesis. The compulsory modules are set by the typical curricula approved by the Federal State Educational Standards (FSES) of Higher Education; the elective modules are defined by SUAI, taking into account current developments in science and technology, as well as the opinion of students and employers. Based on those electives offered, Bachelor and Master students form an individual schedule for each upcoming year.

The Bachelor's programme consists of 240 ECTS, divided over the course of eight semesters. The programme includes 66 modules, of which 18 are elective modules.

The Master's programme consists of 120 ECTS, divided over the course of four semesters. The programme includes 29 modules, of which 12 are elective modules.

During the first three semesters of the Bachelor's degree programme, students acquire the basics in mathematics and physics before they take general courses in computer science and other subject areas such as social sciences, philosophy or physical education. Building

on this, the following five semesters cover mostly the programme-specific courses, so that students gain profound knowledge and competences in information systems and technology. Special attention was paid to the "design" component of the program, since the peers had initially noticed that the curriculum contains only two modules focusing on this specialization. However, further discussion with the programme coordinators revealed that a sufficient number of courses with a focus on design can be found in the electives catalogue. In the consecutive Master's programme, students build on the competences acquired in the bachelor's program in order to deepen their technical knowledge in the field and to extend their analytical, research and application skills.

All in all, the peers have a very good impression of the curricula of both programs and state that they are coherent, well-structured and cover the essential topics in the respective field, enabling also an individual profile building through various elective courses. For the further development of the programs in general and in order to prepare the students for their later professional life, the peers would welcome to see an increase of agile project management being taught in the curricula.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- Admission Regulations
- Statistics on the applicants
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
According to the Self-Assessment Report and the official admission regulations of SUAI, the admission procedure and policies follow national guidelines. Therefore, Russian applicants enter the Bachelor's programme by means of competition, based on the results of a unified state examination, which is taken during the 11th grade of school. For admission to this Bachelor programme, applicants must graduate from school and pass the unified state examination in the fields of Russian language, Mathematics, Physics, Informatics and ICT. Applicants also have the opportunity to take the entrance exams in these subjects conducted by the university.

Annually, the university allocates a concrete amount of state-funded and privately funded places for applicants. Based upon the number of places, the university sets a maximum and

a minimum number of points required for admission. Based upon the results of the entrance exams, students are enrolled to a state-funded place. Applicants unable to enter state-funded places can try to enter the privately funded form of education by signing a schooling contract. In addition, the university allocates places to applicants with special conditions, e.g. applicants with disabilities, orphans or applicants left without parents' custody. Applicants that fall into one of these categories have a guaranteed place if they pass the entrance exam conducted by the university itself successfully.

Graduation from a Bachelor's programme constitutes the basis to enter the Master's programme. Each applicant must pass an entrance exam that is conducted in writing form.

Foreign citizens can apply to both programmes by filling out a questionnaire on the universities websites and hand in prove of their prior knowledge. Then also take the entrance exam and participate in the general competition of the entrance exam results.

From statistics provided in the Self-assessment report, the auditors gather that during the recent five years, the number of applicants are increasing. In 2020, for example, the 459 applications were submitted to the Bachelor programme and 39 applicants of which have been admitted to the state-funded places, while for the privately funded places 9 applications were accepted from the total 76 applications.

For the Master's programme, statistics show that number of applications are also increasing, and 23 students, including 9 international students, were enrolled for the master programme in 2021.

In summary, the auditors find the terms of admission to be binding and transparent. They confirm that the admission requirements support the students in achieving the intended learning outcomes.

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

The peers consider this criterion to be completely fulfilled.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- General Characteristics of both degree programmes (denote the qualification objectives)
- Competency Matrices for both degree programmes
- Internal Rules for Students
- Module handbooks for both degree programmes
- Curricula for both degree programmes
- Information on Student Mobility
- List of cooperation with European universities
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

Each study programme consists of a sum of modules; each module can be finished within one semester. The modules in both study programmes are of varying size. For the Bachelor programme, modules range from 2 ECTS to 10 ECTS, with the majority of modules having 3 or 4 ECTS. For the Master degree programme, modules have a size between 2 and 6 ECTS, with compulsory modules having either 5 or 6 ECTS. To reach the workload, students must attend averagely 7 modules per semester for each degree programme.

From the discussion with the programme coordinators, the auditors understand that additions to the curriculums are mostly offered as elective modules and they can confirm that the choice of elective modules is broad, thus allowing the students to follow their own interests or professional trajectories, which the peers welcome.

Practical work is a mandatory component of both programmes and is aimed at strengthening and deepening theoretical knowledge as well as acquiring skills of an independent and practical nature. According to the curricula, students of the Bachelor programme pass the following types of practices: educational practice for obtaining primary professional skills and abilities; industrial practice for obtaining professional skills and experience; industrial pre-degree practice. For the Master degree programme students have to undertake the following types of practical training: industrial practice / research work; educational practice for obtaining primary professional skills and abilities; industrial practice for obtaining professional skills and professional experience; industrial pre-degree practice. The auditors learn that while students can also undertake their practical training in the laboratories at

SUAI, most students conduct them in the industry. Since students can already make contacts during their studies, it is easier for them to find a job later on. At the same time, the competences and learning outcomes for industrial practice modules described in the competence matrices, still leave room for improvement.

International Mobility

Attention was also paid to the ongoing internationalization process of SUAI and, in this context, to the possibilities offered to students who wish to spend some time abroad. According to the self-assessment report, both study programmes imply a possibility of students to study one semester at another university. SUAI has concluded cooperation agreements with a number of universities abroad. Due to the limited number of mobility opportunities, students are selected by the commission of the department of international affairs on the basis of a language test, a recommendation of the dean or head of department as well as their academic and scientific achievements.

According to the regulations on the current monitoring of academic performance of the SUAI students, every student has the right to credit the results of training in certain modules and/or individual practices mastered. Special attention was paid to the crediting of the trainings conducted at other universities. Discussions with the programme coordinators revealed that this process is carried out by the attestation commission by comparing the training results for each module obtained to those defined by the learning outcomes. The peers learn from the students that their course work is being recognized when they do an exchange semester, but that they normally have to write a final exam at SUAI as well. Although this does in no way seem to be uncommon for the students, the peers emphasise the necessity to develop regulations for the credit transfer and recognition of competences earned outside the university, which include the recognition of final exams.

Criterion 2.2 Workload and credits

Evidence:

- Information on SUAI Credit Points
- Student Surveys
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

According to the self-assessment report, the system of credit points is oriented at the scope of academic workload of the students and has been developed according to the Russian credit points of study intensity defined by the Federal State Educational Standards (FSES).

The amount of credit points of study intensity and ECTS credits is the same. The workload includes both in-class and self-study time.

The number of working hours per ECTS is, according to the module descriptions, 36. However, the university calculates one working hour as 45 minutes so that, in reality, one ECTS amounts to 27 working hours. This is within the realm of European regulation, which holds 1 ECTS between 25 and 30 working hours. In order to create transparency about the actual amount of work, the evaluators expect the university to work with the actual, astronomical hours. Accordingly, the actual working hours must be adjusted in the module handbooks.

The academic year is divided into semesters, each with a duration of 17 weeks. The 4th year of the Bachelor's programme is divided into trimesters for an evenly distribution of the workload. The calculated budget of the academic year for both programmes includes 30 weeks (2 semester of 15 weeks) theoretical studies, 6 weeks (2 sessions of 3 weeks) exam sessions, 7 to 10 weeks of holidays as well as some weeks dedicated to practical work.

During the discussions with the students, the peers learn that they deem the workload as well as the number of exams to be adequate and that they still find time to develop their individual interests and skills taking extracurricular classes.

The peers gain the impression that the workload for both programmes is generally suitable and that modules are adequately credited, with the exception of the physical education modules that students have to take in the bachelor's program. According to the study plan provided to the peers, the students can take up to eight physical education courses, two of which are mandatory, while the other six are electives. However, only one of the eight courses is credited (2 ECTS). The peers emphasize that all modules – whether mandatory or elective – must be credited, and thus urge SUAI to adequately allocate credit points to the seven physical education modules that are currently assigned with 0 ECTS points.

Criterion 2.3 Teaching methodology

Evidence:

- Module descriptions for both degree programmes
- Examples of practice-oriented courses
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

Organization of the academic process at SUAI is aimed at implementing a competence-based approach in education. Students thus analyse and classify information, master meth-

odology of experimental research and tools of management for further practical application. The university uses active methods of teaching approved by the academic council of SUAI. This process is regulated by methodological recommendations; to include new methods of teaching, materials must be presented at the University Methodological Council, which meets once a months.

For the two study programmes under review, the following didactic methods are used: lectures, practical classes, laboratory classes, seminars, practical applications, course projects, research and development work. Teaching can also be conducted online using distance learning technology such as LMS.

During the classes, active and interactive teaching methods (e.g. lectures, discussions, reports, presentations, and group work) are applied. SUAI wants to encourage their students to gain knowledge from different scientific areas and wants to introduce them to research activities. This should ultimately contribute to the transition from a teacher-centred to a student-centred learning approach.

In order to help the students to achieve the intended learning outcomes and to facilitate adequate learning and teaching methods SUAI utilises LMS, a learning management system, designed as a digital platform, where students and teachers can interact.

Overall, the auditors judge the teaching methods and instruments to be suitable to support the students in achieving the intended learning outcomes. Although, many lectures work in a very traditional way, the innovative movements nevertheless are to be found. In this regard, there is still room for improvement to implement diverse and innovative teaching methodologies to educational process. In addition, the peers confirm that the study concept of both programmes comprises a variety of teaching and learning forms as well as practical parts that are adapted to the respective subject culture and study format.

Criterion 2.4 Support and assistance

Evidence:

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
SUAI offers a comprehensive advisory system for all students. In each department, counsellors are appointed from within the teaching staff to consult students concerning the issue of registration for elective modules, forming an individual curriculum, selecting teaching and learning materials or working with the student portal LMS. Another counsellor is appointed to solve organization issues of writing final theses.

In the beginning of each study year, the department teaching staff and the SUAI timetable department compile schedules for consulting Bachelor and Master students individually. At the beginning of each class, the students are furthermore informed by the respective teacher on the types of exams conducted, their organization and their grading criteria. Teachers also provide certain time for individual consultations. A scientific advisor is assigned to each Master and Bachelor student in his or her last year of study. In addition, graduates that already work in partner companies take active part in counselling. Master students conduct classes and hold excursions in their respective enterprises. To ensure the communication level, the peers would suggest providing students with corporate emails automatically as they are admitted to the university.

The peers notice the good and trustful relationship between the students and the teaching staff; there are enough resources available to provide individual assistance, advice and support for all students. The support system helps the students to achieve the intended learning outcomes and to complete their studies successfully and without delay.

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

In its statement, SUAI argues that the physical education modules cannot be credited because they are extracurricular activities. However, the peers emphasize that this is clearly not the case, as these modules are fixed components of the curriculum. Thus, they must also be credited accordingly.

The peers consider this criterion to be partially fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Internal Rules for Students
- Regulations on current monitoring of academic performance and intermediate certification
- Examples of final theses, projects and exams for each degree programmes
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
According to the Regulations on the Current Monitoring of Academic Performance and Intermediate Certification of SUAI, each module is accompanied by an intermediate certification of students that take place either in form of pass-fail test, differentiated tests or exams. While a pass-fail test, as the name suggests, only allows the students to either pass or fail, the grades for differentiated tests and exams are “excellent”, “good”, “satisfactory” and “unsatisfactory”.

Exams take place during the exam period at the end of every semester. The exact scheduling of each intermediate exam is communicated to the students not later than two weeks prior. As a rule, students have no more than one exam per day and a minimum of three days is allotted between each exam. Pass-fail and differentiated test take place during the week preceding the examination period or at the last lesson of the semester. Such kind of assessments is considered as precondition for the exams at the end of semester.

Pass-fail tests can be carried out in oral and written form; differentiated tests and exams can be carried out in oral or written form, in the form of presentation and defence of a course work or project, in the form of submitting and defending a practice report or a research report.

If students fail their intermediate exam, this counts as “academic debt.” Students who have academic debts have the right to re-pass the intermediate certification in the relevant modules no more than twice within the time limits determined. Based on the results of the fall-semester, repeat exams are set either two weeks before or after the start of the next semester. For the spring semester, repeat examinations are scheduled either one week before or two weeks after the beginning of the next academic semester. Students who are unable to liquidate their academic debt within the established time limits are expelled from SUAI.

The peers discuss with the students how many exams or tests they have to take per module. Especially since some modules are rather small in size and students thus have to take up to ten modules per semester. During the discussion, the students confirm that the examination organization works well and flexible and that the workload implied in the preparation of exams is adequate and manageable. According to the students and the official statistics provided in the self-assessment report, the vast majority of students (about 98 %) finish their studies on time.

Forms of exams vary depending on the module specifics. For example, mathematical module exams are based on the theoretical questions complemented with a problem solution part, while the informatics related exams include a software-programming part. In general, oral examinations prevail, as is common in the whole Russian higher education system. In

order to make sure that the forms of assessment are chosen based on the competences the students should acquire, the peers would much appreciate if SUAI introduced more alternative forms of assessment as well, for example project works, written exams, portfolios or papers/essays.

Both programs contain a thesis. The master's thesis is organized in such a way that students work on it over the entire course of their studies, beginning in the first semester. In the first three semesters, students prepare the master's thesis in the modules "Introductory R&D project" and "Main R&D project". In the module "Master's Thesis + R&D project" the final work on the master's thesis takes place.

The peers notice that the regulations on current monitoring of academic performance and intermediate certification do not define rules for disability compensation measures, illness or mitigating circumstances. While the students state that SUAI is supporting them greatly, the peers nonetheless ask SUAI to define the above-mentioned rules bindingly and transparently.

The peers also inspect a sample of examination papers and final theses and are overall satisfied with the general quality of the samples. They confirm that these represent an adequate level of knowledge as required by the EQF level 6 for the three bachelor's program and EQF level 7 for the master's program.

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

With its statement, SUAI hands in three additional official documents in which compensation measures for disabled students are clearly defined.

The peers consider this criterion to be completely fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Staff Handbooks for both degree programmes
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
At SUAI, the staff members have different academic positions: assistant lecturer, senior lecturer, associate professor, professor. The academic position of each staff member is based on research activities, publications, and academic education. For example, a full professor needs to hold a PhD degree. In addition, the responsibilities and tasks of a staff member with respect to teaching, research, and supervision depend on the academic position.

According to the self-assessment report, the teaching staff of the Bachelor's programme consists of 4 professors, 9 associate professors, 2 senior lecturers, 4 assistant lectures and 4 technical staff members (lab assistants, engineers). The teaching staff of the Master's programme consists of 3 professors, 6 associate professors. Additionally, 14 research personnel, 8 PhD students, and 15 technical staff members are involved. Information on each individual is provided in staff handbooks. 68 % of the staff members responsible for the Bachelor's programme and 93 % of those responsible for the Master's programme hold a PhD. This is in line with the Russian Federal State Education Standard that dictates a minimum of 50% of research and teaching staff in a Bachelor's programme holding a PhD and a minimum of 80% for a Master's programme.

The auditors are impressed of how the staff members and programme coordinators are engaged to the process, and certainly, this atmosphere of understanding and support is one of the strong points of the degree programmes.

In summary, the peers confirm that the composition, scientific orientation and qualification of the teaching staff are suitable for successfully implementing and sustaining the degree programmes. They only notice that not all staff members are capable of communicating (and teaching) in English, which they deem desirable not only for their own career-development but also for preparing the students for a possible international career. They thus recommend to further improve the English proficiency as well as the international experience of the staff members.

Criterion 4.2 Staff development

Evidence:

- Example of certificate for further training
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
SUAI supports its staff by offering them PhD programmes as well as the participation in national and international conferences. Permanent development of the staff is ensured by the contribution of professors. In addition, professors of the department actively run scientific directions in the field related to the degree programmes.

With the purpose to improve the teaching quality, didactic and methodological aspects of staff development including problems and possible solutions are considered regularly at the meetings of the department. Academic and didactic development of the teaching staff are mainly organized by the faculty of additional vocational education (FDPO). Didactical and methodological trainings are mandatory for all lecturers. Each lecturer has to participate in at least one didactical workshop per year. They are also encouraged to publish at least one academic article per year. Improvement of digital methodological competencies were of main concern during the COVID pandemic period.

The university also organizes internal conferences for its lecturers and students on an annual basis, where it offers a wide range of trainings in the field of didactics, research or the further development of scientific skills and academic writing. The peers learn that “on-top” achievements in the scientific and methodological field are rewarded with financial bonuses.

Overall, the peers acknowledge the very intense professional development of the staff with regards to their scientific, methodological and didactical skills.

Criterion 4.3 Funds and equipment

Evidence:

- Videos and photographs depicting the equipment of the university
- Information about the availability of equipped classrooms and facilities for practical training (and the software included) Appendix M11 - Information on the department premises
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
To organize the academic process, the university has four study buildings. They entail a number of laboratories, five of which are especially prominent for the two programmes under review: the laboratory of media technologies and computer design, the computing laboratory, the laboratory of computer modelling, the laboratory of information technology, the laboratory of information and network technologies. All laboratories are equipped

with the necessary software and devices. The university provides detailed information on the laboratories both in their self-assessment report and during the audit.

As the audit was conducted online, the peers were not able to visit the laboratories and teaching spaces. Instead, SUAI has provided extensive documentation, including lists of laboratories and equipment and a variety of videos. In addition, the self-assessment report also provided details regarding the overall infrastructure of the university and its campuses. The peers are convinced that the teaching and office facilities, the libraries and the computer labs are sufficient for all students and staff members.

In summary, the peers confirm that the current funding allows for maintaining the standards as well as purchasing further instruments, if necessary, and that SUAI generally holds enough workspaces and laboratories and that all laboratories are equipped with modern and sophisticated instruments.

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

The peers consider this criterion to be completely fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module descriptions for both degree programmes
- Web site per study programme
- Self-assessment report

Preliminary assessment and analysis of the peers:

The module descriptions are accessible for both students and teachers in open access on the university website. The module descriptions include all necessary information about the persons responsible for each module, the teaching methods, the awarded credit points, the intended learning outcomes, the content, the applicability, the admission and examination requirements, and the forms of assessment and details explaining how the final grade is calculated. However, as has been mentioned in criterion 2.2, the workload of each module must be adapted. Moreover, regarding the module descriptions of the master's programme, the peers note that the description of the learning outcomes are in most cases

not competence-based. Therefore, they ask the teaching staff to rewrite these parts of the module descriptions.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Exemplary diploma for both degree programmes
- Exemplary diploma supplement for both degree programmes

Preliminary assessment and analysis of the peers:
The peers confirm that the students of both programmes are awarded a Diploma and a Diploma Supplement after graduation. The Diploma Supplement contains the required information on the student's qualification profile and individual study performance as well as the classification of the degree programmes with regard to its applicable education system.

Criterion 5.3 Relevant rules

Evidence:

- Admission Regulations
- Internal Rules for Students
- Self-assessment report

Preliminary assessment and analysis of the peers:
The auditors confirm that the rights and duties of both SUAI and the students are clearly defined and binding. All rules and regulations are published on the university's website and are hence available to all relevant stakeholders. The students confirm that they felt well-informed about regulations and comfortable about the access to any information about their degree programmes.

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

The peers consider this criterion to be partially fulfilled.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Information on the quality management system
- Example of a student survey
- Letters of appreciation from partners
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
SUAI understand quality as a continuous development of both the study-research activities and an academic culture that expresses itself in conduct, way of thinking, activities and processes aimed at creating value via satisfying requirements of concerned parties. In order to ensure a constant level of quality, SUAI conducts evaluations of the quality of education, monitoring activities as well as internal independent evaluations of the quality of education.

Evaluation of quality of education contains conducting diagnostic and assessment procedures to define a degree of consistency of the parameters of the academic process, its resource support and learning outcomes with the standard requirements and customers' expectations. Monitoring means a comprehensive analytical tracking process, which defines quantitative and qualitative changes of quality of education, which results in defining a degree of correspondence between the measured learning outcomes and the conditions of their achievement. The internal independent evaluation is a further integral system of diagnostic and assessment procedures, which focuses on managing the quality of education at the university level, thereby taking into consideration the requirements and regulatory legal acts of the Russian Federation and the local regulatory acts of SUAI.

All programmes and courses are constantly under review for further development, in particular surveys of each course are carried out on a regular basis. The only issue detected by the peers was the fact that the students do not always receive immediate feedback about the outcome of the respective course evaluations. Since the peers consider it extremely important for reasons of transparency and motivation that students receive feedback about their remarks, they would recommend carrying out discussions with the students about results of the surveys on a regular basis. This will further strengthen the openness and transparency at the SUAI.

In summary, the peer group confirms that the quality management system is suitable to identify weaknesses and to improve the degree programmes. All stakeholders are involved in the process.

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

The peers consider this criterion to be completely fulfilled.

D Additional Documents

Not required.

E Comment of the Higher Education Institution (09.11.2021)

The university provided a short statement as well as additional regulations on disability compensation measures.

F Summary: Peer recommendations (19.11.2021)

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Information Systems and Technology	With requirements for one year	30.09.2027	Euro-Inf®	30.09.2027
Ma Informatics and Computer Technology	With requirements for one year	30.09.2027	Euro-Inf®	30.09.2027

Requirements and recommendations for the applied labels

Requirements

A 1. (ASIIN 2.2) All modules must be awarded with credits that adequately reflect the actual workload. This also applies to elective modules.

A 2. (ASIIN 2.2) For the calculation of credit points, one working hour must correspond to 60 minutes.

A 3. (ASIIN 5.1) Revise the module descriptions to ensure that they describe the learning outcomes in terms of competencies acquired.

Recommendations

E 1. (ASIIN 1.3) It is recommended to teach more classes in English.

E 2. (ASIIN 3) It is recommended to integrate more diverse forms of examination (competence oriented).

E 3. (ASIIN 6) It is recommended to discuss evaluation result with students *on a regular basis*.

G Comment of the Technical Committees

Technical Committee 04 – Informatics/Computer Science (26.11.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows the decision of the peers. It only suggests changing the wording of the recommendation E3.

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

The Technical Committee deems that the intended learning outcomes of the degree programmes do comply with the Subject-Specific Criteria of the Technical Committee 04 – Informatics/Computer Science.

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Information Systems and Technology	With requirements for one year	30.09.2027	Euro-Inf®	30.09.2027
Ma Informatics and Computer Technology	With requirements for one year	30.09.2027	Euro-Inf®	30.09.2027

Requirements and recommendations for the applied labels

Requirements

A 1. (ASIIN 2.2) All modules must be awarded with credits that adequately reflect the actual workload. This also applies to elective modules.

A 2. (ASIIN 2.2) For the calculation of credit points, one working hour must correspond to 60 minutes.

A 3. (ASIIN 5.1) Revise the module descriptions to ensure that they describe the learning outcomes in terms of competencies acquired.

Recommendations

E 1. (ASIIN 1.3) It is recommended to teach more classes in English.

E 2. (ASIIN 3) It is recommended to integrate more diverse forms of examination (competence oriented).

E 3. (ASIIN 6) It is recommended to *regularly* discuss evaluation result with students.

H Decision of the Accreditation Commission (07.12.2021)

Assessment and analysis for the award of the ASIIN seal:

The Accreditation Commission discusses the procedure and in particular the requirements A 1 and A 2. With regards to A 1, the Accreditation Commission highlights that the focus should clearly be on the physical education modules. Instead of forcing the university to credit them, the Commission asks emphasizes that they must be clearly marked as extra-curricular activities. Regarding A 2, the Commission agrees that it must be rephrased to the effect that the university must ensure that one ECTS point corresponds to a student work-load of 25-30 student work hours, with each of them corresponding to 60 minutes. With regards to the wording of the recommendation E 3, it follows the original suggestion of the peer group.

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

The Accreditation Commission deems that the intended learning outcomes of the degree programmes do comply with the Subject-Specific Criteria of the Technical Committee 04 – Informatics/Computer Science.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Information Systems and Technology	With requirements for one year	30.09.2027	Euro-Inf®	30.09.2027
Ma Informatics and Computer Technology	With requirements for one year	30.09.2027	Euro-Inf®	30.09.2027

Requirements and recommendations for the applied labels

Requirements

A 1. (ASIIN 2.2) Clearly mark the elective physical education courses, for which no credit points are awarded, as extracurricular activities.

A 2. (ASIIN 2.2) In all relevant documents, one ECTS point must correspond to a student workload of 25 to 30 student work hours of 60 minutes each.

A 3. (ASIIN 5.1) Revise the module descriptions to ensure that they describe the learning outcomes in terms of competencies acquired.

Recommendations

E 1. (ASIIN 1.3) It is recommended to teach more classes in English.

E 2. (ASIIN 3) It is recommended to integrate more diverse forms of examination (competence oriented).

E 3. (ASIIN 6) It is recommended to discuss evaluation result with students *on a regular basis*.

Appendix: Programme Learning Outcomes and Curricula

The following **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor degree programme Information Systems and Technology:

R1. To master fundamental knowledge in the field of architecture of information systems, in the sphere of design of information systems and networks, databases, in the field of digital processing of images and design.

R2. To design information technology, systems and networks, databases, interfaces of information systems, web- and multimedia information resources.

R3. To use high-level programming languages, script languages, markdown languages, languages and libraries to work with graphical information, applications with systems of databases, front-end and back-end technologies of web design, instrumental means of applied design in order to solve professional tasks.

R4. To apply modern and the most effective tools and methods for development of information systems and technologies, for testing of software, processing of information, design of web and multimedia information resources, create 3D models of objects and scenes.

R5. To administer information systems providing their safety, reliability and effectiveness on the basis of international standards of quality management.

R6. To demonstrate innovations at solving professional tasks, know modern types and styles of design, trends of their development

R7. To analyze and evaluate professional information, interprete important data, create specifications of requirements

R8. To conduct research based on modeling of basic information processes, processing and analysis of experimental data using mathematical methods

R9. To offer the most effective methods of processing of information, including 2D and 3D images in order to increase quality as well as sort out and analyze information features

R10. To be able to develop workflows to organize work on project management, show initiative in processes of management, work in team

R11. To analyze and discuss concepts and proposed solutions, substantiate provisions for solving professional problems.

R12. To demonstrate a creative approach at implementation of projects, skills of conceptual, logical and analytical thinking

R13. To master fundamental knowledge in mathematical, natural science, social-economic fields.

R14. To be able to find sources of information, including this in a foreign language, use the acquired knowledge in practice to solve tasks of professional activity

R15. To master skills of management of own cognitive activity based on self-esteem, self-control and principles of life-long learning

R16. To demonstrate the strategy of life-long learning

R17. To be able to perform professionally-oriented oral and written communication in the national language of the Russian Federation and a foreign language, including communication with task setters and future users of a system

R18. To analyze and consider cultural diversity in the process of intercultural interaction.

R19. To demonstrate ability to work in international team

The following **curriculum** is presented:

Methods and tools for designing information systems and technologies (exam, course paper) 3 ECTS	Economics of technical projects in information technology (test) 2 ECTS	Reliability of information systems (test) 2 ECTS	Fundamentals of quality assurance of information systems (test) 3 ECTS	Intelligent systems and technologies (exam) 3 ECTS	Administration of information systems (exam) 3 ECTS	Information system interfaces (test) 2 ECTS	3D scene modeling and virtual reality (course paper) 1 ECTS		Industrial predegree practice (graded test) 3 ECTS	State Final Certification (exam, Graduation work) 9 ECTS	31 ECTS
Methods and tools for designing information systems and technologies (exam) 4 ECTS	Theory of information processes and systems (exam, course paper 3 ECTS	Information security (exam) 3 ECTS	Online services (graded test) 4 ECTS	Information transmission hardware (test) 3 ECTS	Applied design tools (exam, course paper) 4ECTS	Integrated systems and technologies (test) 2 ECTS	3D scene modeling and virtual reality (exam) 3 ECTS	Technical design tools (graded test) 3 ECTS			29 ECTS
Information processing technologies (exam) 4 ECTS	Theory of information processes and systems (graded test) 4 ECTS	System modeling (exam) 3 ECTS	Network programming (test) 2 ECTS	Computer image processing (exam, course paper) 5 ECTS	Basics of design theory (exam) 4ECTS	Web technologies (exam, course paper) 5 ECTS		Physical education (test) 2 ECTS	Applied physical education (elective module) (test) 0 ECTS	Industrial practice/ research wor) (graded test) 3 ECTS	32 ECTS
Computer architecture (exam) 3 ECTS	Infocommunication systems and network (exam, course paper) 4 ECTS	Data management (exam, course paper) 5 ECTS	Basics of control theory (graded test) 3 ECTS	Cross-platform programming (exam) 4 ECTS	Assembler programming (test) 2 ECTS	Design workshop (test) 3 ECTS	Computer graphics (exam) 4 ECTS	Physical education (test) 0 ECTS	Applied physical education (elective module) (test) 0 ECTS		28 ECTS
Foreign language (exam) 2 ECTS	Electronics (graded test) 3 ECTS	Programming technologies (exam, course paper) 4 ECTS	Computational mathematics (exam) 3 ECTS	Information systems architecture (exam) 4 ECTS	Information system tools (graded test) 3 ECTS	Jurisprudence (test) 2 ECTS	Life safety (test) 3 ECTS	Basics of information technology in design (graded test) 4 ECTS	Applied physical education (elective module) (test) 0 ECTS	Industrial practice (graded test) 3 ECTS	31 ECTS
Foreign language (test) 2 ECTS	Social and political science (test) 3 ECTS	Psychology and pedagogy (test) 2 ECTS	Theory of probability and mathematical statistics (exam) 4 ECTS	Electrical engineering (graded test) 4 ECTS	Basics of programming (exam, course paper) 5 ECTS	Physics (exam) 4 ECTS	Information technology (exam, course paper) 5 ECTS		Applied physical education (elective module) (test) 0 ECTS		29 ECTS
Foreign language (test) 3 ECTS	Culture studies (test) 3 ECTS	Mathematics. Analytical geometry and linear algebra (exam) 3 ECTS	Mathematics. Mathematical analysis (exam) 3 ECTS	Discrete mathematics (exam) 4 ECTS	Basics of programming (exam) 5 ECTS	Physics (graded test) 4 ECTS	Philosophy (exam) 4 ECTS		Applied physical education (elective module) (test) 0 ECTS	Educational practice (graded test) 3 ECTS	32 ECTS
Foreign language (test) 3ECTS	History (exam) 4 ECTS	Mathematics. Analytical geometry and linear algebra (exam) 3 ECTS	Mathematics. Mathematical analysis (exam) 4 ECTS	Mathematical logic and theory of algorithms (test) 3 ECTS	Ecology (test) 2 ECTS	Economics (exam) 3 ECTS	Direction introductory course (test) 2 ECTS	Informatics (exam) 4 ECTS	Applied physical education (elective module) (test) 0 ECTS		28 ECTS

The following **learning objectives (intended qualifications profile)** shall be achieved by the Master degree programme Informatics and Computer Technology:

O1. Training Masters who can make critical analysis of problem situations based on the system approach, elaborate action strategy

O2. Training Masters who can manage a project at all stages of its lifecycle.

O3. Training Masters who can organize and lead teamwork developing a team strategy to reach a set goal.

O4. Training Masters who can use modern communication technologies including those in foreign language(s) for academic and professional interaction.

O5. Training Masters who can analyze and consider diversity of cultures in the process of intercultural interaction.

O6. Training Masters who can define and implement priorities of their own activity and means of its upgrading based on self- esteem.

O7. Training Masters who can independently acquire, develop and use mathematical, natural science, social-economic and professional knowledge to solve non-textbook tasks including those in a new or unknown environment and in the interdisciplinary context.

O8. Training Masters who can develop original algorithms and software including use of modern intelligent technologies to solve professional tasks.

O9. Training Masters who can analyze professional information, highlight the main provisions, structure, formulate and represent in the form of analytical reviews with substantiated conclusions and recommendations.

O10. Training Masters who can use in practice new scientific principles and methods of research.

O11. Training Masters who can develop and update software and hardware of information and automated systems.

O12. Training Masters who can develop components of software-hardware complexes of information processing and automated design.

O13. Training Masters who can adapt foreign complexes of information processing and automated design to the needs of national enterprises.

O14. Training Masters who can efficiently manage development of software and projects.

O15. Training Masters who can develop methods of implementation of analytical works.

O16. Training Masters who can integrate and endorse the developed software, computing systems, communication equipment.

O17. Training Masters who can develop means and systems of information protection of automated systems.

O18. Training Masters who can conduct synthesis of a logical scheme in the basis of a selected technological library based on set time and physical limitations using means of automated design.

O19. Training Masters who can provide scientific supervision in the corresponding field of knowledge.

The following **curriculum** is presented:

4	Teaching practice *(credit)* *6 ECTS*	Industrial practice *(credit)* *6 ECTS*	Final exams *(exam)* *9 ECTS*	***Master's Thesis + R&D project*** *(defense)* *6 ECTS*						30 credits
3	Artificial neural networks *(exam)* *4 ECTS*	*Systems for digital image processing* *(exam)* *5 ECTS*	Entrepreneurship basics *(credit)* *5 ECTS*	Information safety and security *(exam)* *6 ECTS*	Onboard computing networks *(credit)* *3 ECTS*	*Computer networks and telecom.* *(exam)* *4 credits*		Scientific seminars *(credit)* *1 ECTS*	**Main R&D project** *(credit)* *2 ECTS*	30 credits
2	Intellectual systems (exam) *6 ECTS*	Systems for digital signal processing *(exam)* *3 ECTS*	Optimization methods *(credit)* *5 ECTS*	Transmission of discrete messages *(credit)* *2 ECTS*	Systems- and Networks-on-Chip *(credit)* *2* ECTS	Architecture of parallel systems *(exam)* *6 ECTS*	Systems modeling *(credit)* *2 ECTS*	Scientific seminars *(credit)* *1 ECTS*	*3 ECTS*	30 credits
1	International language *(exam)* *6 ECTS*	Methodology of scientific cognition *(credit)* *5 ECTS*	Project mng. for inf. Systems (exam) *6 ECTS*	Math. methods for scientific research (credit) *2 ECTS*	Embedded Systems Design in VLSI (exam) *3 ECTS*	Parallel programming *(credit)* *3 ECTS*		Scientific seminars *(credit)* *1 ECTS*	**Introductory R&D project** *(credit, defense)* *4 ECTS*	30 credits