

Peoples' Friendship University of Russia, Moscow
- Academy of Engineering -
International Accreditation of Study Programmes



Experts' Report

8th Meeting of the ZEVA Commission on November 5, 2019

Reference Number I-1737-1

Study Programme	Degree	Programme Duration	Type of Programme	Maximum annual intake
Space Mission and System Design	Master	2 years	Full-time	20

Accreditation contract signed on: September 27, 2018

Date of site visit: May 21/22, 2019

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Hanover, August 13, 2019

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I Vote of the Expert Panel and Decision of the Accreditation Commission

1 Decision of the ZEvA Commission (ZEKo) of November 5, 2019

I. Vote of the Expert Panel and Decision of the Accreditation Commission

1. Decision of the ZEvA Commission (ZEKo) of November 5, 2019

The ZEvA Commission follows the experts' report and agrees with their recommendations. The commission also takes note of the university's written response to the experts' report, as well as the experts' feedback in return.

The Commission decides to accredit the Master's programme Space Mission and System Design as offered by Peoples' Friendship University, Moscow for a period of six years.

The university is required to submit a follow-up report to ZEvA within a period of two years. The report needs to include concrete and detailed information on the ways in which the recommendations of the experts have been adopted.

This decision is based on the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), the Framework of Qualifications of the European Higher Education Area and the recommendations of the ECTS Users' Guide as referred to in the ZEvA Manual for the External Assessment of Study Programmes.

2. Experts' Appraisal

2.1 Executive Summary

The experts are convinced that the programme in Space Mission and System Design imparts skills and knowledge at Master's level. In particular, students are well supported in further developing their research competencies and their problem-solving skills. Due to its close cooperative ties with the local space industry the programme opens excellent career prospects for graduates on the Russian market. The students benefit from a high-quality learning environment and dedicated teaching staff, and their needs are tended to in the best possible way.

Nonetheless, from the experts' point of view the programme does not yet entirely live up to its own goals. In particular, the international profile of the programme needs further strengthening, and the narrow focus of the curriculum should be widened to include more interdisciplinary elements.

The cooperation with the local space industry provides good job opportunities, especially to Russian citizens, although it should be kept in mind that the programme is designed for a relatively narrow employment sector.

Moreover, the ECTS credit points awarded in the programme should be checked for plausibility. To this end, an adequate quality assurance tool needs to be developed.

2.2 Final Vote of the Expert Panel

The expert panel recommends the accreditation of the Master's programme in *Space Mission and System Design* as offered by *People's Friendship University, Moscow* for a period of six years.

To support the further enhancement of the programme, the experts give the following recommendations:

- The experts recommend further sharpening the international profile of the programme. English should be used more frequently in class, and both outgoing and incoming student mobility should be more strongly supported, as, for example, by offering more internship placements abroad.
- The thematic focus of the programme should be widened by introducing a larger variety of (elective) courses from related disciplines. In particular, students should acquire at least some basic knowledge in spacecraft design and aerospace technology.
- The university should further pursue the implementation of its quality assurance tools at programme level. This applies especially to course evaluation, which should be more frequently applied and more strongly formalized.

1 Vote of the Expert Panel and Decision of the Accreditation Commission

2 Experts' Appraisal

- The experts strongly recommend introducing a close and regular monitoring of student workload at programme/and or class level as a standard quality assurance tool.
- The topic of remote sensing should be more effectively integrated into the curriculum. To this end, more teaching staff with expertise in this field should be hired.

II Evaluation Report of the Expert Panel

0 Introduction: Purpose, Design and Context of the Accreditation Procedure

II. Evaluation Report of the Expert Panel

Introduction: Purpose, Design and Context of the Accreditation Procedure

In September 2018, People's Friendship University of Russia (RUDN University) mandated ZEvA with the international accreditation of three Master's programmes, all of which are offered by the university's Academy of Engineering.

For the purpose of assessing the study programmes, the university was asked to submit a self-report in English including an appendix of documents, as e.g. selected course syllabi, CVs of teaching faculty, central statistical data, relevant formal regulations and policies as well as sample questionnaires for course evaluation. All documents were translated into English before submission.

During the entire review process, ZEvA was supported by the colleagues of the Russian accreditation agency AKKORK, who provided assistance in all organizational and administrative matters.

ZEvA and AKKORK jointly assembled three international expert panels (one group of experts for each programme) who conducted a two-day site visit in Moscow in May 2019. The site visit involved talks with members of the university leadership board, the director of the Academy of Engineering, the head of the quality assurance department, as well as teaching faculty, students and graduates of the programmes. Also, the experts were given a tour of the university campus.

The quality assessment was conducted based on the ZEvA Manual for the External Assessment of Study Programmes. The assessment framework laid out there was developed with close reference to the "European Standards and Guidelines for Quality Assurance in Higher Education (ESG)" (ENQA 2015), the "Framework of Qualifications for the European Higher Education Area" (2005) and the "ECTS Users' Guide" (European Communities, 2015).

This accreditation report refers to the Master's programme "Space Mission and System Design". It is based on the experts' assessment of the self-report and the outcomes of the on-site talks and will serve as a basis for the final accreditation decision of the ZEvA commission. Provided the decision is positive, ZEvA will award its quality seal for a limited time period, after which the university can apply for re-accreditation of the programme.

Separate accreditation reports were generated for the other two programmes of the cluster (Reference Ns. I-1736-1; I-1738-1). All reports will be published on the ZEvA website upon finalization.

The experts would like to thank the Vice-Rector for Academic Affairs of RUDN University, the Director of the Academy of Engineering as well as all faculty, staff and students involved for the friendly reception and the open and constructive atmosphere during the on-site talks in Moscow.

1. General Aspects

1.1 Profile and Mission of the University

Peoples' Friendship University (RUDN University) was founded in 1960, with the prime goal of providing higher education to students from developing countries in Asia, Africa and Latin America, as well as to Russian students from low-income families. The university is located in Moscow, with an additional branch in Sochi.

Still today, internationality and multi-culturality lie at the heart of the university's profile and mission: students from 150 countries are currently enrolled at RUDN University. The university (slogan: "Discover the World in One University!") is co-operating with more than 250 foreign universities and research centres worldwide and offers a wide variety of foreign-language Master's programmes.

This strong international orientation also becomes apparent in the strategic aims that the university names for the period from 2018 to 2020 (cf. self-report, p. 5):

- *To increase the contribution of RUDN University to the development of human capital for solving regional and global problems of humanity in the fields of innovation and infrastructure, urban development, energy, sustainable development, linguistic and civilizational problems of modern society and healthcare;*
- *To strengthen the position of RUDN on the world stage as the most international university in Russia*
- *Significantly expand the presence of the university in the global digital socio-cultural and educational environment*
- *To strengthen the integration of the new brand of RUDN University into the international space.*

In 2012 RUDN University was authorized to develop and apply its own educational standards in addition to the national standards. As the third university in Russia, RUDN University also gained the status of an autonomous university in 2014. As such, RUDN University can take independent management decisions on strategic, administrative and financial matters.

The university presently counts a total of around 31.000 students, about 8.500 of whom are from outside Russia. RUDN University offers educational programmes (mainly Bachelor's, Master's and Ph.D. programmes) in all the subject disciplines of a classical university, including Humanities and Social Sciences, Medicine, Engineering & Technology, Agriculture, Languages and Media, Economics and Management.

Organizational Structure

According to the website, RUDN University hosts six faculties and 10 institutes, complemented by the Academy of Engineering as an independent organizational unit.

II Evaluation Report of the Expert Panel

1 General Aspects

The university is headed by a Rector and 12 Vice-Rectors with different areas of responsibility, including the Vice-Rector for Academic Affairs. The most important collegial body at central level is the Academic Council, consisting of the members of the Rectorate, the President of the University, the heads of the faculties and institutes as well as elected representatives of the students and staff. The Academic Council is responsible for the general strategic management of the university, which includes the provision of quality educational services.

Furthermore, a Supervisory Board and a Fiduciary Board function as the main advisory bodies of the university. Various external stakeholders are represented in the boards, as e.g. state authorities, employers and graduates.

The Student Council is the umbrella organization that unites all student associations and committees under one roof. It represents and protects the interests of all RUDN students and ensures sufficient student participation in the general management and governance of the university. It also deals with student appeals and organizes extracurricular activities.

The Academy of Engineering came into existence in 2016 as part of an internal re-organization process resulting in the dissolution of the former Faculty of Engineering. It currently hosts about 3.000 students, one third of them foreigners, and more than 200 teaching staff. As was reported on site, the Academy is involved in a broad range of study programmes, including several Master's and Ph.D. programmes taught in English. The academic disciplines covered include Space Technology, Mining and Geology, Nanotechnology, as well as Mechanical and Electrical Engineering.

Experts' Appraisal

From the experts' point of view, the mission, profile and ambitious vision of People's Friendship University are described very clearly on the university website and in the self-report. The university holds a unique position among Russian higher education institutions, especially as far as the aspect of internationality is concerned.

With a view to that, it seems somewhat surprising that the study programme "Space Mission and System Design", which the university selected for international accreditation, does not show a particularly international profile. The programme is exclusively taught in Russian and is mostly aimed at Russian students. Employment prospects for graduates are also primarily located on the Russian labour market (cf. Chapter 2). Outgoing student mobility, if at all, only plays a minor role, which may partly be due to the fact that some students study part-time only whilst simultaneously holding working positions in industry. In this respect the programme does not represent the university and its strategic goals. Hence, the experts recommend further sharpening the international profile of the programme. For example, the Academy should consider switching to English as the prime teaching language, or at least increasing the number of courses taught in English in order to make the programme more attractive for internationals, to facilitate outgoing mobility and to generally enrich the study experience (cf. Chapter 2.3).

II Evaluation Report of the Expert Panel

1 *General Aspects*

The organizational structure of the university is sufficiently laid out in the self-report. The experts especially commend RUDN University on the various options for students to participate in university governance and quality assurance. Nonetheless, as far as the experts can assess, all internal and external stakeholders are sufficiently represented in the internal governance structure of the university.

1.2 Student Support Services

RUDN University has described its advisory and support structures for students in detail in its self-report. Services include special tutoring and mentoring for first-year students and international students. Furthermore, the university is planning to offer psychological and pedagogical counselling for students in the near future.

The Department of Social Development (DSD) is, among other things, responsible for the integration of students with disabilities and has set up a hotline to provide advice on issues related to inclusive education.

RUDN University ensures that students with physical impairments receive equal access to learning resources at the library. Some of the dorms and lecture rooms are equipped to fit the special needs of disabled students. Also, special conditions may apply to them during examinations and in the process of student admission and selection.

A career center (Department of Students' Practices and Employment Organization) supports students in finding internship placements and working positions upon graduation.

Students may always approach their tutors and academic advisors in all academic matters. The students and graduates interviewed during the site visit reported that teachers, as a general rule, were accessible and supportive throughout.

To create equal opportunities for students and applicants, RUDN University offers various scholarships, including financial support for incoming foreign students and for RUDN students who wish to study abroad.

Foreign students may turn to the "Foreign Students Recruitment and Support Department" for advice.

The experts have gained the overall impression that RUDN University has implemented comprehensive and efficient support structures for its diverse student body. Students with special needs are offered a broad range of services and activities to help them integrate into university life and to make good progress in their studies

Lecturers appear to be very dedicated and always ready to provide advice to students whenever needed. Furthermore, the student organizations may be approached for appeals, requests and complaints of any kind.

1.3 Student Mobility and Recognition of Credits

According to the self-report, RUDN has closed numerous cooperation agreements with universities all over the world. Agreements relate to the regular exchange of staff and/or students or to the joint development of educational programmes. The university also actively participates in the Erasmus+ mobility programme.

The total number of outgoing RUDN students currently lies at around 800 per year, whereas the number of incoming foreign students is usually a lot higher, due to a high number of programmes directed especially at foreign students.

RUDN University has gradually implemented ECTS in its study programmes since the year 2005. All graduates from Bachelor's and Master's programmes receive a Diploma Supplement in addition to the state diploma.

The experts commend RUDN University on its extensive network of cooperating partners which includes a broad range of higher education institutions as well as other partners from inside and outside academia. With regard to outgoing mobility, there still seems to be room for further optimization, which applies both to the university as a whole as well as the Master's programme discussed here. Hence, the experts strongly support the university's continuing participation in the Erasmus + programme.

The Master's programme in Space Mission and System Design is no exception from this general effort to internationalize: for example, the programme has forged cooperative partnerships with universities in Peru, Guatemala and Malaysia (even though it did not become clear in the course of the site visit whether any concrete projects have already been initiated in the context of these cooperation agreements).

"Free movers" outside the framework of partnership agreements and the Erasmus programme seem to be an exception. Accordingly, no additional rules or criteria for the recognition of credits earned abroad were made known to the experts. In case such regulations exist, the university is kindly asked to provide the panel with more information on this aspect.

Moreover, the programme has so far seen little incoming student mobility. The experts assume that this might be related to the language of teaching.

1.4 Quality Assurance

The self-report includes an elaborate description of the university's internal quality management system. The university has implemented a central department concerned with the quality assurance of educational programmes, which deals both with internal quality management and matters of external licensing, certification and accreditation. In addition, there are units responsible for quality assurance at decentral level.

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1 General Aspects

The main quality objectives (quality strategy) of the university are published on the RUDN University website. Also, a quality manual is provided which regulates the key processes of the quality assurance system.

The applied methods and tools for quality assurance include regular monitoring of performance indicators, centralized process management and continuous monitoring of student satisfaction, for example by means of interviews or round tables. Written satisfaction surveys are conducted among students, staff, employers and graduates on a regular basis. The results of the surveys are published in the form of quality reports.

Apart from the measures applied at central level, faculties may conduct their own surveys to assess the quality of teaching in particular study programmes or educational units. Based on the survey results, programmes may, for example, be updated in terms of content or teaching methods. Furthermore, each faculty and institute has its own student commission for the quality of education. At least once per semester the chairpersons of these commissions meet up with the Rector to discuss quality issues, which results in a protocol and an action plan.

In its self-report, RUDN University has presented a list of 15 quality indicators that are monitored both for each study programme and for the entire university. These indicators refer to aspects of internationality (e.g. number of joint programmes), but also to the qualifications and research output of staff, average student performance and to student satisfaction with the quality of education.

Based on the information provided in the self-report and during the site visit, the experts conclude that RUDN University has created a complex, state-of-the-art internal quality assurance system which involves all internal and external stakeholders to a satisfactory extent. The study programmes are regularly monitored and revised with a view to the strategic and operational goals of the university and to the aim of continuous improvement. The institutional quality assurance policy and quality strategy are published on the university website, and the responsibilities for quality assurance are clearly assigned.

In the course of the site visit, the experts got the impression that the quality assurance system is formally established and functional, but not yet implemented to a sufficient degree. Both the students and staff interviewed on site displayed a relatively low awareness of the quality assurance tools and procedures, as well as the outcomes of quality surveys. Direct and informal feedback mechanisms exist, but there seems to be little familiarity and experience with the “official” instruments. Based on these impressions, the experts recommend promoting the implementation of quality assurance tools at programme level more intensely. This applies especially to course evaluation, which should be applied more frequently and formalized more strongly. Students should more often get the chance to provide anonymous written feedback on classes by means of standardized questionnaires. The questionnaires should also include a free comment option, and the lecturers should reflect together with their students on the survey results and on the consequences drawn from them.

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1 *General Aspects*

Furthermore, the experts strongly recommend introducing a close and regular monitoring of student workload at programme/and or class level as a standard quality assurance tool. The on-site talks have revealed that the awarded ECTS credits do not always accurately reflect the actual workload (cf. Chapter 2), and to the experts' knowledge there is no mechanism yet to identify and remedy such discrepancies.

1.5 Transparency and Public Information

All key information concerning the study programme is publicly available (both in Russian and in English) on the RUDN website. This includes descriptions of the intended learning outcomes and career prospects for graduates. The course syllabi and the exam requirements are made known to the students at the beginning of the semester. Regulations on student assessment are documented and published.

As far as the experts can see, the students receive all the information they need about their study programme and its requirements in due time. However, the experts would like to point out that the English version of the university website is not yet complete and thus sometimes refers international site visitors to sections that are available in Russian only. In view of the institution's internationalization strategy, this issue might be addressed in the future.

2. Assessment of the Study Programme

2.1 Key Facts

The Master's programme in "Space Mission and System Design" was first introduced in the year 2015 and currently counts 24 enrolled students and 17 graduates (figures quoted from the self-report). The programme is identified as a 2-year full-time course and awards a total of 120 ECTS credits, out of which 65 credits are attributed to theory-based classes and 46 credits to internships and projects in research and development. Nine credits are awarded for the Final State Examination which includes the defence of the Master's thesis.

Graduates of the programme are qualified to proceed to doctoral level as stipulated in the Russian and European qualifications frameworks.

2.2 Intended Learning Outcomes

The intended learning outcomes of the programme are published on the university website and are also outlined in the self-report. According to the self-report graduates of the programme are able to:

- *present a mathematical description of ballistic and aerodynamic parameters and characteristics of objects, parameters and characteristics of the mechanics of motion and controlled motion of objects, perform mathematical modeling of processes and objects;*
- *apply scientific research methods, mastered on the example of the study of modern and future space systems;*
- *analyze and develop recommendations on the flight dynamics results of studies and objects operation;*
- *apply efficient algorithms and optimization techniques when conducting research on the aircraft flight dynamics and space systems control;*
- *develop mathematical and computer models for analyzing space systems and synthesizing their models;*
- *to take into account the peculiarities of the operation of aerospace control objects under the conditions of disturbing influences of the external environment;*
- *apply organizational and team management skills;*
- *apply decision making skills;*
- *implement an integrated approach to solving problems when creating samples of space technology; think systematically, understand the principles of interaction of elements in the system, the interaction of the system and the external environment, the causes and characteristics of changes in the system.*

Students of the programme are trained to become competent experts in ballistics and flight dynamics in the space industry or in research and development institutions. The programme is also meant to open employment prospects in the IT sector, in banking or in administration, as graduates possess profound knowledge in Applied Mathematics and programming languages.

The experts confirm that the intended learning outcomes of the programme are fully in line with the Master's level as defined in the Framework of Qualifications for the European Higher Education Area, and with Level 7 of the European Qualifications Framework. In the self-report this is also demonstrated by means of a survey chart which relates the intended learning outcomes and their underlying standards to the Dublin Descriptors (Knowledge and Understanding; Application of Knowledge and Understanding, Making Judgments, Communication Skills, Learning Skills/Learning Ability).

In the course of the assessment, some confusion was caused by the chosen translation of the programme title „Space Mission and System Design“, which from the experts' point of view does not accurately reflect the actual profile of the programme, but rather suggests a focus on Spacecraft Engineering instead of Applied Mathematics. In some of the appendices to the self-report the title „Ballistic Design of Space Complexes and Systems“ is used instead. The experts recommend using this or a similar, more precise translation for any future descriptions of the programme in English. Generally, it should become as clear as possible that the programme puts an emphasis on Mathematics and Physics rather than Engineering and Construction (cf. Chapter 2.3 below).

2.3 Profile, Content and Curricular Structure

As already briefly mentioned above, the Master's programme encompasses both theory-based coursework and practical work in the context of internships and research projects. In terms of credits awarded, theory and practice are of almost equal weight within the programme.

As is common practice at RUDN University and other Russian universities, the curriculum is divided into a basic part which is compulsory for all students and a variable part which includes both mandatory units and a number of elective subjects.

The majority of the “basic” classes provide comprehensive general knowledge in Mathematical Modelling. In a second step this theoretical knowledge is applied to the field of aerospace technology, with a particular focus on ballistics and flight mechanics. Students learn to develop methods, algorithms and software for the operation of spacecraft and to apply them in practical contexts.

Students may complete their research internships in industrial enterprises or in research and development institutions, including RUDN University itself (although the on-site talks revealed that most students choose placements in the industry, if they are not already em-

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2 Assessment of the Study Programme

ployed there anyway). All students receive continuous advice and guidance from personal supervisors throughout this part of their studies. During their internship students are expected to further deepen their research skills and to apply the acquired theoretical knowledge in practical contexts. Also, they work on their own projects in preparation for the final Master's thesis. The research internship stretches across the first three semesters. In the fourth and final semester, students absolve another internship in industry (so-called "pre-diploma" internship) in order to deepen their professional skills and experience.

Students are encouraged to publish their research results and to participate in (national) scientific conferences wherever possible.

In order to obtain their degree, students have to pass the Final State Examination and to successfully defend their Master's thesis, as prescribed by national law.

Although the programme is designated as full-time, the experts learned during the site visit that many of the students study part-time while continuing to pursue their professional careers. As a result, the students of the programme do not form a homogeneous group but move through the programme at individual paces based on different time schedules.

The students also proved to be quite diverse in terms of their prior qualifications and training. Only some of the students participating in the on-site interviews had a background in Physics or Mathematics, while others had obtained their first degree in a completely different field, as e.g. Economics. In order to be admitted to the programme, applicants must sit a written entrance examination to test their knowledge in areas relevant to the programme, as e.g. Mathematics or Physics. Applicants are ranked according to the results of the written exam. Additional individual achievements are taken into account as well. In case of equal scores, personal interviews may also be conducted. The provided statistic figures show that the number of applicants usually exceeds the number of places available, which applies particularly to the state-financed and "budget" places.

In the course of the site visit, the experts have gained the overall impression that the Master's programme in Space Mission and System Design succeeds in imparting skills and knowledge at Master's level. In particular, students further develop their research competencies and their problem-solving skills. The Master's theses presented to the experts during the site visit confirmed this general impression.

The individual needs of the students are tended to in the best possible way, especially as far as organizational issues are concerned, and students displayed a high level of satisfaction during the on-site interviews.

From the experts' point of view, the admission and selection procedure sufficiently ensures that all students possess the necessary level of knowledge and skills to master the programme requirements, in spite of diverse academic backgrounds.

The programme also notably benefits from the strong interest and support of the Russian space industry, which provides internship placements and, in some cases, even covers the students' tuition fees.

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2 Assessment of the Study Programme

In spite of all these positive aspects, the experts find that the programme concept is not without inherent risks and does not entirely live up to its own goals. The curriculum is strongly focused on providing highly specialized, in-depth mathematical knowledge, without touching much upon related disciplines, as e.g. space engineering and technology. As a result, graduates are well-qualified for a small, narrow section of the Russian labour market, but not fully prepared to meet the expectations of the international space industry, which would require a wider, more systemic perspective. The minor significance attributed to foreign languages, especially English, also contributes to the experts' overall impression that in terms of content, the programme does not yet show the desired international profile. At present, the experts' general impression is rather that of a continuous education programme set up to fulfil the specific needs of the local or regional industry.

In order to ensure full consistency with European and Russian standards, the experts recommend including compulsory courses on spacecraft design and aerospace technology into the curriculum. In addition, the thematic focus of the programme should be widened by introducing a larger variety of (elective) courses from related disciplines, as, for example, additional courses on earth remote sensing or on the navigation and control of spacecraft. As the on-site talks have shown, there is well-qualified staff at hand to teach these disciplines. Another option could be to create more overlaps and interdisciplinary projects with other Master's programmes of the Academy of Engineering. For example, a unit on space materials could be of interest both for the students of this programme and for students of Nanotechnology. Likewise, a unit on remote sensing could be of equal relevance both for the students of Space Technology and Mining and Geology.

In order to sharpen the international profile of the programme, the experts also recommend offering more internship placements abroad. Students should also be more strongly encouraged to make use of such opportunities and more actively supported in this endeavour.

Moreover, as already outlined in Chapter 1.1, English should be more frequently chosen as teaching language in class.

Furthermore, more emphasis should be put on imparting relevant key competencies as e.g. leadership skills or presentation skills.

Apart from questions of content the experts are uncertain about the accuracy of the calculated student workload as reflected in the awarded ECTS credit points. The students interviewed on site gave very mixed answers about their weekly workload, and it does not seem plausible that those students who work part-time manage to fulfil the requirements within the same time frame as non-working students. The experts therefore see reason to believe that, on average, students invest substantially less time into their studies than is assumed. The student workload should therefore be monitored more closely, as already outlined above. In case the results reveal a strong mismatch between the credit points and the actual average workload, adequate measures should be taken in response, as e.g. an enhancement of the programme's content.

2.4 Methods of Teaching and Student Assessment

Most educational components of the programme combine lectures or seminars with laboratory work. In addition, students spend substantial periods of time on research and development projects. As outlined above, these projects are mostly absolved in an industrial context. In general, the students also regularly present the results of their group or individual projects in class.

Various types and methods of student assessment are applied in the programme, including oral and written tests, presentations, papers, lab work or written homework assignments. The in-class performance of students also has an impact on the overall grade. According to the RUDN regulations failed exams may be repeated twice within the first two months of the following semester.

Based on all information provided, the experts conclude that the applied methods of teaching and assessment are adequate for a Master's programme of this discipline and are well aligned to the intended learning outcomes. The strong focus on industry projects should be particularly highlighted as a special feature of the programme that distinguishes it from similar programmes at other Russian universities.

2.5 Teaching Faculty

In total, six professors and five associate professors teach in the Master's programme in Space Mission and System Design, supported by a small number of senior lecturers and assistants. CVs of all academic staff have been submitted as part of the self-report, and the experts had the opportunity to conduct on-site talks with a large part of the teaching faculty.

As was shown in the documentation and confirmed during the talks, many of the lecturers are no members of the RUDN faculty, but hold their main working positions at other universities or in the industry and hence contribute only part of their time to the Master's programme.

The programme is headed by the Director of the Academy of Engineering who is also the main person responsible for the coordination and the design of the programme, as well as for the selection and recruitment of teaching staff.

According to the teaching faculty interviewed on site, the university provides a relatively high budget for staff mobility and has implemented a teacher training scheme.

Based on the written and oral information provided, the experts conclude that the programme has a sufficient number of highly qualified teaching staff at its disposal. The Director of the Academy of Engineering is highly dedicated to the cause of the programme and is clearly a strong and efficient driving force behind it.

In view of the profile and the target group of the programme, it is very reasonable to involve lecturers from industry, as long as didactic standards are maintained. Special attention should be paid to this aspect in the context of quality assurance.

In spite of that, the experts take a critical view of the fact that the majority of the teaching faculty comes from outside RUDN University, as this impedes real teamwork among the teachers and results in the lack of a sufficient “backbone” of faculty to ensure the long-term sustainability of the programme. The Academy should therefore discuss possible ways to minimize this risk.

The topic of remote sensing seems to be a current development field for the programme, but still appears largely isolated at present, with only one person to teach this discipline. The experts therefore recommend increasing the personnel resources in this particular field.

2.6 Infrastructure, Resources and Learning Environment

During their visit in Moscow the experts were given a tour of the main RUDN University campus, which included the central library and the Flight Control Center at the Institute of Space Technology. The self-report also includes a lot of general information on the infrastructure and facilities at RUDN University. Lectures take place both at the main campus and at the Academy of Engineering, which are located in some distance from each other within the city of Moscow.

The students of Space Mission and System Design interviewed on site were generally satisfied with the quality of the learning environment, as well as with the library and software equipment provided at the university. Some students also use software at their companies for study purposes, or programme software on their own.

The experts have gained the overall impression that the students of the Master’s programme benefit from a modern learning environment and have all means at their disposal to reach their intended learning outcomes. This also includes a sufficient number of computer pools. The library is well-equipped and provides generous workspace for students, as well as access to a large variety of e-papers via online databases like Scopus and Elsevier.

The Flight Control Center is a great asset of the programme, as it facilitates flight mechanics training in a near real-life environment. However, in the course of the site visit the experts gained the impression that this valuable facility is not yet used to its full potential and could be more effectively integrated into the educational process, particularly in the context of student research projects. The university is encouraged to comment on this aspect once again in its response to the experts’ report.

For the further development of the study programme, additional technical laboratories to support the students’ education in related fields of spacecraft design are also recommended.

The experts support the students’ idea of introducing a shuttle service to avoid inconvenience caused by long transfer times between the main campus and the Academy.



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Alternatively, lectures should be scheduled in such a way that students do not need to change locations during the day.