Assessment report
of the Main Educational Programme of Higher Education
02.04.02 "FUNDAMENTAL INFORMATICS AND INFORMATION TECHNOLOGIES"

Master's programme

"MANAGEMENT OF INFOCOMMUNICATIONS AND INTELLECTUAL SYSTEMS"

**Faculty of Science
People's Friendship University of Russia (PFUR)
(RUDN UNIVERSITY)**

Table of contents

I. INFORMATION ON ACCREDITATION PROCEDURE

Subject of accreditation procedure

Educational programme	Degree to be acquired	ETCS	Duration	Form of education	Language of instruction
Management of Infocommunications and intellectual systems	Master	120	2 years	full-time,	Main - Russian

Date of on-site visit: June 08-09, 2017.

Panel members:

Enrique Herrera Viedma, Universidad de Granada (Spain). Appointed by DEVA.

Alberto Peinado Domínguez, Universidad de Málaga (Spain). Appointed by DEVA

Onokoy Ludmila, deputy head of Business Informatics department, Financial Universuty under Goverment of Russian Federation.

Sidohin Felix, founder and lead statistician of QuantAce Inc.

Mirzoyan Mariam, Financial Universuty under Goverment of Russian Federation**.**

II. PANEL MEMBERS REPORT

Introduction: aims, structure and general provisions of the accreditation procedure

Agencies for assessment of the quality of education and accreditation (DEVA-AAC: Andalusian Agency of Knowledge, Department of Evaluation and Accreditation, Córdoba, Spain) and (AKKORK: Autonomous Non-Profit Organization Agency for Higher Education Quality Assurance and Career Development, Moscow, Russia) on February 20, 2016 signed an agreement on cooperation in international accreditation of an educational program in the Peoples' Friendship University of Russia (Moscow, Russia). To this end, a panel group was created, consisting of two Spanish reviewers (university academics) with the assistance of three Russian reviewers from the academic and non-academic environment including representatives of the student community.

All members of the group participated in a two-day visit to the university in June 2017. During the visit, meetings and interviews were held with the university's top management, the deans, students and graduates of all educational programs, as well as with employers and with the teaching staff. Earlier, the University had provided AKKORK with a self-assessment report and applications, which were later translated into English and forwarded to the agency DEVA-AAC and international members of the reviewers committee. Evaluation of educational programs by the reviewers is based on the sent written material, additional documents, provided on request, and the results of the visit.

Review of the institutional profile of the Peoples' Friendship University of Russia

Russia joined the Bologna process in 2003 and since then has consistently adhered to the basic objectives of the Declaration at the national and institutional levels. Part of this process was the introduction of a two-stage system of education at the national level in accordance with the "Framework for Qualifications of the European Higher Education Area". Program of the first stage usually last 4 years; graduates acquire a bachelor's degree. The second stage includes two years of study and ends with the acquiring of a master's degree. Graduates can later continue their education already at PhD (PhD - Doctor of Philosophy), and then the Doctor of sciences. It should be noted that the Peoples' Friendship University of Russia is a pioneer in the introduction of the Bologna process in the educational area of the Russian Federation.

Federal state educational standards define the learning outcomes of each educational program at each level of qualification. Also, the structure and content of the

curriculum depends largely on the requirements of the Ministry of Education and Science of the Russian Federation.

All bachelor's and master's programs consist of several cycles, that is, courses of lectures from different disciplinary areas, the educational program do not focus only on a specific educational area, but offer more general education, such as the humanities and social sciences. This is especially true for bachelor students.

Peoples' Friendship University of Russia was founded on February 5, 1960 by the decision of the Government of the USSR. On February 22, 1961 the University was named after Patrice Lumumba - one of the symbols of the struggle for the independence of the peoples of Africa. The Russian language classes at the preparatory faculty for foreign students began in 1960, and at the six basic faculties of the University (Engineering, History and Philology, Medical, Agricultural, Physical, Mathematical and Natural Sciences, Economics and Law) - on September 1, 1961. In 1964, the University became a member of the International Association of Universities (IAU).

Nowadays the structure of the PFUR comprises 5 main faculties: Faculty of Physics, Mathematics and Natural Sciences, Faculty of Ecology, Faculty of Philology, Faculty of Humanities and Social Sciences, Faculty of Economics, Engineering Academy; 10 institutes: Medical Institute, Law Institute, Institute of Foreign Languages, Agrarian-technological Institute, Institute of World Economy and Business, Institute of Hospitality Business and Tourism, Academic Research Institute of Gravitation and Cosmology, Institute of Medical and Biological Problems, Academic Research Institute of Comparative Educational Policy, Institute of Space Technologies.

The distinctive features of the educational process at the Peoples' Friendship University of Russia are:

- Credit system ECTS
- European Diploma Supplement
- Worldwide academic mobility
- Up to 800 academic hours of foreign languages learning
- Diploma in translation (2-3 foreign languages)
- Over 1500 courses for continuing education
- All postgraduate forms of education (master, PhD, DSi, Clinical residency, internship)
- Teaching in foreign languages

PFUR has the right to set its own educational standards (sanctioned by Russian President, 2012).

The University has a team consisting of more than 5,000 employees, among them - about 2,500 teachers, including 500 academics and doctors, more than 1,200 professors and candidates of science, 57 full and correspondent members of the Russian Academy of

Science and field- specific academies, 28 Honored Scientists of Russia, 26 full members of foreign academies and scientific societies.

The educational process and research activities of the University are maintained by the sufficient material and technical equipment. For example, the following indicators can describe the fully computerized library of the PFUR:

- Library branches and reading halls in 5 University buildings
- More than 17,000 users
- 1 800.000 copies and library items at the library stock
- Online access to more than 36 foreign & Russian databases
- 90 000 foreign literature pieces in 70 languages
- Electronic collections of PFUR professors' publications
- University has 45 educational and scientific centers, 150 scientific laboratories.

The outcomes of work of professors' and researchers of the PFUR are: 870 copyright certificates, 160 patents of the Russian Federation and 2 scientific inventions, 84 certificates for computer programs and databases (PFUR intellectual rights).

According to international ratings the PFUR is included in the World Top-500 in the QS World University Rankings. In 2011-2014 in the annual National universities proposed assessment by Interfax and Echo of Moscow PFUR ranked 4-6th among all Russian universities the most internationalized university.

III. INTRODUCTORY REMARK

Albeit, currently, there is not a generally agreed protocol for assessing the quality of post-obligatory educational degrees in countries other than the evaluating agency's home country, it seems appropriate to employ criteria roughly analogous to those that would apply if the evaluating agency and the evaluated institution were both located in the same country. Therefore, the seven criteria that will be taken into account in this report correspond, with some qualifications and adaptations, to the structure of the manual elaborated to that effect by the Andalusian Agency for University Quality Evaluation and Accreditation (AGAE / DEVA). Specifically, we relied upon the 2016 edition of the "Guide for Renewing the Accreditation of University Bachelor's and Master's Degrees in Andalusia".

For each of these seven criteria, we chose one of four possible ratings, namely:

"Fully conform"

"Substantially compliant"

"Partially compliant", and

"Not compliant".

As applied here, the latter implies very serious shortcomings and might, depending on the criteria in question, originate an unfavorable overall assessment. A rating as "partially compliant" implies shortcomings severe enough to demand a markdown. A "substantially compliant" rating implies a satisfactory situation; however, there may be some, or even considerable, room for improvement. Therefore, whatever the rating chosen for each criterion, we encourage stakeholders to pay close attention to our comments and recommendations.

IV. OVERALL ASSESSMENT

Comment: After studying the self-assessment report, a vast range of internal documents, and holding extensive on-site meetings with the program's administrators, teaching staff, students, graduates and employers, as well as with staff of PFUR's quality management and general leadership, we appreciate the program's quality.

It is remarkable (1) that the bigger proportion of theoretical aspects respect to the practical ones is considered positive by the groups of interest and provides important tools to solve problems from an abstract point of view, and the capacity to learn and apply new technologies in the specific field of the master degree programme; and (2) the teaching staff, very involved in the activities of the master, presents high expertise in the research and teaching processes, and show good relationships with the international scientific community.

Assessment: FULLY CONFORM

V. ASSESSMENT OF KEY QUALITY CRITERIA

CRITERION 1. PUBLIC INFORMATION AVAILABLE

Comment: The qualification provides all relevant information about the programme at the PFUR official web site. This information includes the title, the field of application, the quantity of ECTS, the subjects, and the intensifications. Additional information is also provided by means of the Moodle platform used by students.

Information about the internal quality assurance system could be expanded. The results of the performance or employment indicators of the graduates could help a better knowledge of the degree by new students. A better position of the program could be achieved against other competing universities. Likewise, it would be advisable to publish plans aimed at improving the program.

All of that information is provided in Russian language. The English version must be strongly improved because (1) it provides less information than the Russian; and (2) it does not show all contents in English. Instead, Russian texts appear between English texts.

Recommendations

- Information on the results of the internal quality assurance system of the program and the improvement plans should be published on the official website.
- English version of the official website should contain the same information as the Russian one.
- English version should appear only in English, removing fragments in Russian. A general revision should be applied.

Assessment: SUBSTANTIALLY COMPLIANT

CRITERION 2. QUALITY ASSURANCE SYSTEM

Comment:

PFUR has a policy for quality assurance that is part of their strategic management. The quality policy and the internal bodies lead the management of quality assurance were formally established by a Rector's Order on November 3rd, 2010 through the document *Quality assurance regulation on the organization and conducting of educational and work practice of the PFUR students*. More recently, a *Reception and consideration of appeals (complaints, applications, proposals) of students, employees of the University and other citizens to management of PFUR* has been settled by a Rector's Order (18 January 2016).

The internal quality assurance of PFUR is settled in the Document Management of Education Quality System (EQS), which was approved in 2012. The documented procedures deal with the document and data management, internal audits, control of non-conforming product and correcting and preventive actions. Those procedures have written in accordance with the requirements of ISO 9001: 2008. PFUR Organization structure is also established and documented.

The implementation of the EQS procedures is carried out through various fundamental activities according to the (1) the development of the training program (2) the collection data and opinions on the development and results of the program (3) the analysis of data collected and identification of non conforming product (4) the elaboration and development of improvement plans and (5) the revision of the fulfilment of the improvement plans. More information on the tools used to solicit input from stakeholders (teachers, students, graduates or employers) would help to improve the transparency of the EQS procedures.

Process, resources, performance or employment indicators are the main visible products of the EQS implementation. Some indicators are collected centrally but quality specialists at the departments collect most of them. Then all indicators are normalized and on the basis of normalized indicators, quality diagrams are constructed for the university as a whole for each core educational unit (CEU) in each direction and specialty. The comparison is also made with the target set annually and with the lower limit established. The presentation of the results through tables and comparative graphs are adequate to show the results of the programs. However, written reflections from the tables and graphs would help to know how deans or department heads and their teams value the results and argue to explain them.

The monitoring of the indicators based on the comparison of facts and annual plans is made. As a result of it, a Plan of improvement activities of the program is written. The

improvement plan includes those indicators have not reached the planned values, the measures that should be adopted to correct the gap, the responsible of the measures be executed and the execution period.

Recommendations:

- Expand EQS 01 to EQS 05 procedures in greater detail so that it is possible to know which instruments are used to collect stakeholder opinion. The procedure of reception and consideration of appeals (complaints, applications, proposals) of students, employees of the University and other citizens to management could be a good example of what we mean.
- Write the monitoring reports so that they include not only tables and graphs but also explanatory arguments that allow to know how the members of a faculty or department value the indicators.
- In order to improve the quality of the program a significant role could be played by the Board of Trustees created of the bachelor and master's programs graduates. Its active participation in the definition of programs content or organization of internships for students and teachers, would improve the quality of the educational program.
- It seems to be worthy to conduct periodically anonymous surveys among employees, teaching staff and students to get a more complete picture of the quality of the educational process. An analysis of the data would allow to focus more precisely on its efforts to improve the quality of education.

Assessment: SUBSTANTIALLY COMPLIANT

CRITERION 3. DESIGN, ORGANISATION AND DEVELOPMENT OF THE EDUCATIONAL PROGRAMME

Comment: We consider that the design, structure and the content of the master is adequate. The curriculum includes 120 ECTS, distributed as follows: Final state examination (9 ECTS), Practical works, including scientific and research work (54 ECTS) and Disciplines (54 ECTS). The disciplines credits are distributed in a main part (27 ECTS) and a flexible part (30 ECTS) that includes the elective disciplines (16 ECTS).

Master's program "Management of infocommunications and intellectual systems" is realized without participation of partner universities. Nevertheless, in 2016 cooperation agreements were concluded:

• between RUDN and Brno University of Technology;

• between RUDN and the University of Mediterranea of Reggio Calabria, Italy;

• between RUDN and the University of Pisa, Italy.

For the internship at Tampere University of Technology, Finland, in 2016, were sent two students of this programme.

Teaching materials are well organized and include different parts, so that the students know them from the first day of class: Objectives of the discipline, competences, type of educational work (total hours), contents of the discipline, subject of practical classes and workload, the list of basic and additional educational literature, and the score rating system.

The management of the faculty and departments, the teaching staff, representatives from the internship places, potential employers of the graduates, graduates of the program take part in the design of the curricula and the syllabi of the disciplines. The recommendations of the latter are taken into account when planning technology and teaching methods, drawing up and adjusting curricula for the subjects taught. Master classes are conducted both by the faculty of the university, and by foreign teachers and practitioners, among whom there are graduates of RUDN.

The Master's program uses information and communication technologies (ICT) to provide students with educational and methodological materials for students' class and independent work, as well as for knowledge control. Educational and additional materials on the disciplines are available:

• in the telecommunication educational information system of RUDN (TUIS, http://esystem.pfur.ru/);

• on the educational portal of the Department of Applied Informatics and Probability Theory on the pages of teachers (https://stud.sci.pfu.edu.ru/);

• in the RUDN electronic-library system (http://lib.rudn.ru/MegaPro/Web).

The methodologies of the education activities are adequate for this kind of technological master.

The programme is developed only in Russian. For this reason most of students come from the Russian Federation and CIS, and funded by the state. The number of students is 40 on average in the last years, 36 in 2016 distributed as 31 from the Russian Federation and CIS, and 5 foreign students. During the visit, the panel has observed that most of the

foreign students have suffered from severe difficulties with the Rusian language. Some of these students have written the final degree project in English.

The panel has also noted, during the interviews, that a subgroup of the teaching staff, students and graduates speaks English fluently. The current state of the educational programme does not seem too consistent with its expected international character.

Students have an opportunity to learn foreign language on "Interpeter" program, which allows students to improve their language skills.

Currently, the students are organized in two groups of 20. Students, graduates and teaching staff consider this size adequate. This size is consistent with the material and human resources available at the Faculty of Science.

The employers and graduates are satisfied with the technical knowledge acquired and the soft skills developed by the students.

Students do not have the opportunity to enroll in "double diploma" program at the partner university and get two diplomas. Students are not sufficiently informed about the possibilities of obtaining various scholarships for achievements in science and social events. It is important to note that the master's program has an online platform - an educational portal and a university-wide portal. The educational portal is a good tool for close cooperation within the educational program between teachers and students: gaining new knowledge, obtaining additional home control tasks, receive an information on the results of checking tests, etc.

Recommendations:
It would be interesting to give several subjects, or at least several lectures in English, to advance in the internationalization of the programme. In this sense, the utilization of English language will help to improve the programme by means of the contributions of external teachers and researches from the international scientific community.

The program has two completely different components: fundamental computer science and intellectual systems. It is recommended to consider the possibility of dividing this field of study into two profiles and create two separate curriculum, so it was more understandable to distribute academic hours to each discipline for each profile.

Assessment: SUBSTANTIALLY COMPLIANT

CRITERION 4: TEACHING STAFF

Comment: The information provided about the teaching staff by the self-assessment report was not clear enough. Several tables (in page 46) contained values different from the ones appearing in the text. The staff components were not clearly described. During the visit, information was clarified.

Comment: Teaching staff consisted of internal teachers, academic profile, complemented with several external part-time teachers with a professional profile. Their qualifications seem to be appropriate to teach their respective subjects. In general terms, they present high expertise in research and teaching activities. External part-time teachers come from relevant companies and institutions in Moscow, and many of them are members of Russian Association of Artificial Intelligence. All of them participates are involved as teachers of several disciplines and members of examination commissions.

Teaching staff is very involved with the development of the master degree programme. This is evidenced through the printed materials (book format) elaborated by the teachers for each subject, providing a very useful guiding reference to the students. However, that material is printed only in Russian.

The size of the teaching staff is also appropriate to the number of students and the teaching methodology. Furthermore, the staff is increased with five additional teachers exclusively dedicated to qualification work management.

Students and graduates express a high level of satisfaction with teaching staff.

Teaching staff shows close relationships with the international scientific community in the topics developed into the master degree programme.

Recommendation:

-It is recommended to consider the possibility to provide the printed materials written also in English, in order to increase the real level of internationalization of the programme.

-It would be desirable the implementation of programs to stimulate production and increase the international impact of research carried out by teaching staff involved in the program.

-It is recommended to seriously consider the participation of international teachers or researchers in the teaching staff.

- It is also recommended to give some lectures in English.

- To develop measures of motivational support of the teaching staff to develop educational electronic content for the methodological support of independent work of students.

Assessment: SUBSTANTIALLY COMPLIANT

CRITERION 5: INFRASTRUCTURE, SERVICES AND PROVISION OF RESOURCES

Comment: Infrastructures for teaching are suitable for the group size in this master degree programme (2 groups, each group with 20 students). The information reported has been checked during the visit. The number of classrooms (different sizes) and computer labs is in line with the number of students. They are conveniently equipped with usual teaching furniture and multimedia technology. Required software is updated and wireless Internet is available. However, one of the problems is insufficient equipment with licensed software products. A virtual platform is used to complement classroom training and learning. Convenient library services are provided to students. Immediate access to key books and documents is guaranteed for all students. The library hosts a reading room and space to facilitate collaborative work. It is also provide an adequate access to the electronic resources, particularly research journals from main editorials as IEEE and Elsevier.

Additional complementary facilities and services (accommodation, restaurants, reprographics, etc.) are also provided to assist students in their learning process. Both teachers and students are satisfied with material resources and services.

It is important to note that teachers elaborate printed materials (book format) for every subject of the master degree programme. These books constitute the main reference for students and really help them to acquire the technical knowledge. These materials are printed only in Russian.

Recommendations
-It would be interesting to look for new collaboration spaces between enterprises and the master, for example, by means of the organization of summer schools or specific workshop focused on particular interest topics.

-Internationalization programs should be strengthened in order to facilitate the interaction with other universities, master programmes and research groups.

-The printed materials, developed by the teachers, provided to the students should be written in English, in order to increase the internationality of the master programme.

Assessment: SUBSTANTIALLY COMPLIANT

CRITERION 6: LEARNING OUTCOMES

Comment: A very detailed description of the competences to be acquired by students is available. There are three types of competences: general culture (GC), general professional competencies (GPC), and professional competencies (PC). Every single competence includes a competence description and the subjects that help the students to get those competences. In addition, each competence description includes what the students are going to know and what the students are going to be able to do. Every teaching material includes these competences, so that, students know what skills and learning are going to achieve and how.

Comment: Evaluation methodology is adequate to the subjects. Besides the evaluation performed at each subject (57 ECTS, corresponding to 47.5% of the whole programme), the students are evaluated on the basis of several practical works (scientific and research) and a final degree project. For that evaluation, specific committees containing external experts in their composition are organized.

Comment: It is important to note that some of the final degree projects have been written in English, although it is derived from the difficulties observed at several cases with the Russian language.

Comment: Students are invited, as a complement for their education, to participate in scientific seminars hold at the departments involved in the educational programme, such as Dept. of Applied Informatics and Probability Theory, and Dept. of Informational Technologies.

Comment: The students and graduates confirm, during the interviews, that they are learning or have learnt what they expected at the very beginning of their studies. The employers are satisfied with the technical knowledge acquired by the graduates. This is a relevant fact taking in mind that the employers are involved in the design and development of the educational programme.

Recommendations

1. In order to improve the quality of the program, it seems important to reduce the share of theoretical courses and increase the number of practice-oriented disciplines using modern tools in class.

2. To intensify the work in the field of expanding the list of up-to-date software available for students, including licensed software and software provided to Russian universities by global vendors through programs of academic initiatives.

Assessment: FULLY CONFORM

CRITERION 7. SATISFACTION AND PERFORMANCE INDICATORS

Comment: The satisfaction of all the groups of interest is high. Graduates and students confirm that the master degree programme satisfies their expectations and would recommend it to other students. The panel has got this information during the interviews because no data was previously obtained by the PFUR and, consequently, no information appears at the self-assessment report.

The satisfaction degree about the design of the master observed in all groups of analysis is good in general terms.

Satisfaction with the achievement of learning outcomes by students and university teachers is checked through a questionnaire, the results of which are posted on the website "Quality of Learning in RUDN": http://quality.rudn.ru/?pagec=886. The results of the study and the measures planned for them are discussed and adopted by the Academic Council of the Peoples' Friendship University of Russia, the Academic Councils of the Faculties.

1. The students' survey "Quality of learning in RUDN" includes interviews with students from all faculties. The survey is conducted once in 3 years. Reports and comparative analysis are available on the website "Quality of Learning in RUDN" (http://quality.rudn.ru/?pagec=886) and are available to all students, their parents, all interested parties.

2. Questionnaires among teachers are done in all faculties. The survey is conducted once in 3 years. Reports and comparative analysis are available on the website "Quality of Learning in RUDN" http://quality.rudn.ru/file.php?id=386) and are available to all interested parties.

During the interview, the graduates expressed full satisfaction with the knowledge obtained at the university. The process of their professional adaptation was short-term (from 3 to 6 months) and professional career is formed in accordance with their

expectations. Employers also reported a high degree of satisfaction with the skills of students (with internships) and graduates (hired as employees). They noted the orientation toward the research activities, a great interest in the effectiveness of their work, the ability to prepare qualitatively report materials, reports, presentations and speak to the professional community as a characteristic feature of the RUDN graduates.

Comment: The employment rate is 100%. This value is compliant with the international rate in this field. In the present case, there is a close connection with the business world, allowing the graduates to find a qualified job.

Graduates of the program work as the leading IT specialists and analysts of information departments of large companies, design engineers, system engineers, information system engineers, service managers, IT project managers and architects, consultants for the implementation of infocommunication and intelligent systems. Examples of companies where graduates are employed: IBM, LANIT, Kaspersky Lab, IPONWEB, INEL Management Company, Megafon, VimpelCom, Jet Infosystems, Raiffeisen Bank, ZAO UniCredit Bank "," Tinkoff Credit Systems ", etc.

Comment: The programme developed during 2014-16 presents a low drop-out rate (26%) and a graduation rate around 74%, which is a high value in this field. However, these values are worse than those obtained in the previous period 2013-15, where the drop-out rate was 8% and the graduation rate was 92%. Since no additional information has been provided, these values represent an instantaneous negative trend that should be analyzed.

Theoretical training, acquired over several years, and knowledge of various languages allow many students to work in foreign companies. In addition, the curriculum is based on modern teaching methods, including using information and communication technologies, so students are given skills that enable them to become very promising candidates first for internships, and then for full-time contracts.

Recommendations:
-Following the employers' criteria, it should be convenient to update some content in order to incorporate additional application software and programming language, more related with the enterprise management.

-Although the current values for drop-out and graduation rates are adequate, additional information on drop-out and graduate rates must be considered to analyze if they respond to an isolated situation or belong to a real trend.

Assessment: SUBSTANTIALLY COMPLIANT