

## STUDY PROGRAMME ACCREDITATION

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### MATHEMATICAL MODELS IN INTERDISCIPLINARY RESEARCH

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FEDERAL STATE AUTONOMOUS EDUCATIONAL  
INSTITUTION OF HIGHER EDUCATION «PEOPLES»  
FRIENDSHIP UNIVERSITY OF RUSSIA  
~RUDN UNIVERSITY~

FINAL REPORT

16/12/2020

<b>PROGRAMME</b>	<b>MASTER´S DEGREE IN INTERNATIONAL PRIVATE LAW</b>
<b>UNIVERSITY</b>	<b>RUDN UNIVERSITY (RUSSIA)</b>
<b>CENTRE</b>	<b>FACULTY OF PHYSICS MATHEMATICS</b>
<b>VISIT DATE</b>	<b>November 30, 2020 and December 2, 2020</b>

The Aragon Agency for Quality Assurance and Strategic Foresight in Higher Education (ACPUA) has carried out the assessment for the accreditation of this programme under a partnership agreement with Agency for Quality Assurance in Higher Education and Career Development (AKKORK).

After studying the corresponding self-evaluation report and carried out a virtual site visit (due to the situation created by the global pandemic), a draft report was sent to the University with the provisional result of the evaluation.

After the deadline without any allegations having been made to the draft report, this final evaluation report is issued.

This report has followed the European Standards and Guidelines (ESG), compliance with which has been accredited by ACPUA, as it is an agency registered in the European Register (EQAR).

The visit to the programme has been carried out in accordance with the *ACPUA Guide of action for virtual visits* approved by the Commission of Evaluation, Certification and Accreditation of the ACPUA and published on the Agency's website.

The panel of international experts (included in Annex I of this report) issues the following draft report, giving the university 10 days to make the allegations it deems appropriate.

## KEY ASPECTS OF THE PROGRAMME

### COMMENDATIONS

- Strong, centralised Quality Assurance System that provides common indicators for the University.
- Students are taught a broad range of mathematical knowledge as well as IT skills such as data analysis.
- Students show a very high level of satisfaction.
- Employers consider former students capable of adapting to new challenges.
- There are future teachers for the programme because some students go on to study a PhD.

### RECOMMENDATIONS

- Display of more public information both in Russian and English.
- A bigger effort to attract new students, although it is understandable that it is difficult to accomplish. International students could be a good source for this.
- The goal of the Master's degree should be more clearly stated and all the teaching staff should be aware of it in order to work together towards a common idea.
- Stochastic models could be a good addition to the programme.

## EVALUATION CRITERION

### DIMENSION 1. DEGREE MANAGEMENT

#### Criterion 1. ORGANISATION AND DEVELOPMENT

The training programme is up to date and has been implemented in accordance with the conditions set out in the verified report and/or its subsequent amendments.

1.1	The <b>implementation</b> of the curriculum and the <b>organisation</b> of the programme are consistent with the competency profile and objectives of the degree set out in the verification report and/or its subsequent amendments.	NA - Not Applicable
1.2	The defined graduation profile (and its deployment in the curriculum) maintains its <b>relevance</b> and is <b>updated</b> according to the requirements of its academic, scientific or professional environment.	A. Passed with excellence
1.3	The degree has <b>mechanisms for teacher coordination</b> (horizontal and vertical articulation between the different subjects) that allow both an adequate allocation of the student's workload and adequate time planning, ensuring the acquisition of the learning results.	B. Achieved
1.4	The admission criteria applied allow students to have the appropriate entry profile to begin these studies and their application respects the <b>number of places offered</b> in the verified report.	NA - Not Applicable
1.5	The application of the different <b>academic regulations</b> is carried out in an appropriate manner and allows the values of academic performance indicators to be improved.	B. Achieved

#### Evaluation criterion 1: B. Achieved

The entrance profile is adequate, being centred on graduates in mathematics and certain engineering degrees.

The graduation profile and the deployment of the curriculum is in line with what is expected from a Master's degree programme whose goal is that graduates acquire skills to be able to model phenomena in different disciplines. Graduates from this Master's degree are capable of facing up to any problem in order to find the right method to solve it. The satisfaction shown by their employers in the interviews is a very good sign to this regard.

The study plan includes a wide range of applied tasks and is organised to allow students to build an individual path according to their interests.

Although there is not a formally established coordination mechanism, there is a Methodological Commission that ensures that this coordination takes place.

Nevertheless, it is recommended to formalise the system of both horizontal coordination, among all teaching staff in the same year, and vertical coordination, among the professors that take part in the first and second year of the Master's degree.

In order to try to find a solution for the low demand, we recommended analysing the possibility of incorporating courses in applied discrete mathematics and network theory, which might help attract students with an interest in modern interdisciplinary mathematics applied to fields such as molecular biology, ecology, social sciences and economics, finance, etc.

It is recommended to provide clearer public information on the objectives of the Master's degree and the results in employment of graduates. Highlighting these aspects would have a positive impact in terms of student recruitment.

## Criterion 2. INFORMATION AND TRANSPARENCY

The institution has mechanisms to adequately communicate to all stakeholders the characteristics of the programme and the processes that guarantee its quality.

2.1	Diploma holders publish <b>appropriate and up-to-date information</b> on the characteristics of the training programme, its development and its results, both in terms of monitoring and accreditation.	C. Partially achieved
2.2	The <b>information needed</b> for decision-making by potential students interested in the degree and other stakeholders in the national and international university system is <b>easily accessible</b> .	B. Achieved
2.3	Students enrolled in the degree have timely access to relevant information on the <b>curriculum</b> and <b>expected learning results</b> .	C. Partially achieved

### Evaluation criterion 2: C. Partially achieved

2.1: Although the institutional website contains a great deal of general and specific information in Russian regarding this programme, it is essential that this information is regularly updated to guarantee its relevance and also expanded to make further information available on aspects such as: programme objectives, graduate profile/employment opportunities, subject learning outcomes, teaching staff, programme indicators, external internship opportunities etc.

2.1: It would be positive to observe further hard evidence of the outputs of the quality assurance system on a programme level: action plans, objectives, indicators, survey results, graduate employment data etc. It is essential that the majority of this information be made available to stakeholders – students, lecturers, employers, external reviewers, society in general etc. via appropriate channels including the institutional website, in accordance with the European Standards and Guidelines.

2.2: Given the level of internationalisation of RUDN as a whole and the international nature of this programme, particular attention should be paid to the adequacy and scope of information available in English (aimed at international candidates/students and international universities).

2.2: In order to attract international students, web-based information should not only be standard information translated into English but also specific information for international candidates: life in Russia, accommodation, support mechanisms for international students etc.

2.3: Information is available on the curriculum and course content although specific programme objectives should be included as should learning objectives for each subject.

### Criterion 3. INTERNAL QUALITY ASSURANCE SYSTEM (IQAS)

The institution has an internal quality assurance system formally established and implemented that effectively ensures the continuous improvement of the degree.

3.1	The IQAS implemented and regularly reviewed ensures the <b>continuous collection and analysis of information and relevant results</b> for the effective management of the diploma, in particular learning results and stakeholder satisfaction.	A. Passed with excellence
3.2	The implemented IQAS <b>facilitates</b> the process of monitoring, modifying and accrediting the degree and guarantees its continuous improvement based on the <b>analysis</b> of objective and <b>verifiable</b> data.	B. Achieved
3.3	The implemented IQAS has procedures that facilitate the <b>evaluation and improvement of the quality of the teaching-learning</b> process.	B. Achieved

#### Evaluation criterion 3: B. Achieved

3.1: RUDN has a robust and complete quality assurance system designed and implemented in accordance with the European Standards and Guidelines (2015). The system provides for interaction with stakeholders and mechanisms to collect their opinions.

3.1: Leadership of the system is clearly a responsibility of the senior management of the university and the system is deployed down through the organisation to specific programme level where programme leaders coordinate the implantation of institutional guidelines.

3.1: Student representatives have an annual meeting with the Rector's office to discuss student satisfaction with their programmes, a sign of open dialogue and fluid communication between stakeholders and university management.

3.2: As well as surveys, the institution (and programme) also uses face-to-face tools – meetings, round-tables, interviews – to encourage dialogue with and collect information from stakeholders such as students, lecturers, graduates and employers in order to formulate improvements to the programme.

3.2: The programme leaders are responsible for analysing outputs from the quality assurance system. Stakeholders have confirmed that improvements have been implemented in the programme although the panel has seen no evidence of traceability (meeting minutes, survey results etc.) of these actions back to the quality assurance system.

3.3: Although no hard evidence has been provided, programme lecturers have confirmed that through regular meetings improvements are proposed to teaching, learning and assessment methodologies. Likewise, students are able to put forward suggestions both informally, through direct dialogue with the teaching staff, and formally through the mechanisms defined by the quality assurance system.

## DIMENSION 2. RESOURCES

### Criterion 4. ACADEMIC STAFF

The academic staff that is teaching is sufficient and adequate, according to the characteristics of the degree and the number of students.

4.1	The academic staff of the degree meet the level of <b>academic qualification</b> required for the degree and have adequate <b>teaching and research experience and quality</b> .	B. Achieved
4.2	The academic staff is <b>sufficient</b> and has <b>adequate dedication</b> for the development of their functions and to assist the students.	B. Achieved
4.3	The teaching staff is updated in such a way that, taking into account the characteristics of the degree, they can approach the <b>teaching-learning</b> process in an appropriate manner.	B. Achieved
4.4	(Where applicable) The university has implemented the <b>commitments</b> included in the verification report and the <b>recommendations</b> defined in the verification reports, authorisation, where applicable, and monitoring of the degree relating to the hiring and improvement of the teaching and research qualifications of the teaching staff.	NA - Not Applicable

#### Evaluation criterion 4: B. Achieved

The teaching staff is sufficient to cover all the teaching needs of the Master's degree and their dedication to the University is generally full-time.

There is a significant number of international teachers who collaborate with the Master's by lecturing thematic seminars and workshops on problems of pure and applied mathematics as well as mathematical simulation.

The selection of the teaching staff is adequately carried out in accordance with the criteria established in "Rules of organization and conduct of competitive selection of applicants for the RUDN Teaching staff positions".

Performance is correctly assessed and an individual incentive payment may be assigned if the indicators are met at a higher level than planned. Research activity is also promoted through financial incentives for the publishing of scientific articles.

There is no evidence of the existence of a Teaching Staff Training Plan for professors. It is recommended that a procedure be designed to establish such a plan.

It is also recommended that there be an open link from the Master's degree website to the Curriculum Vitae (or a brief summary) of each of the Master's degree teachers.



### Criterion 5. SUPPORT STAFF, MATERIAL RESOURCES AND SERVICES

The support staff, material resources and services made available for the development of the degree are adequate according to the nature, modality of the degree, number of students enrolled and skills to be acquired by them.

5.1	The <b>support staff</b> involved in the training activities is sufficient and adequately supports the teaching activity of the academic staff associated to the degree.	B. Achieved
5.2	The <b>material resources</b> (classrooms and their equipment, work and study spaces, laboratories, workshops and experimental spaces, libraries, etc.) are adapted to the number of students and the training activities programmed in the degree.	B. Achieved
5.3	In the case of <b>distance/semi-presential</b> learning degrees, the technological infrastructure and associated teaching materials allow for the development of training activities and the acquisition of the skills of the degree.	NA - Not Applicable
5.4	The academic, vocational and mobility <b>support and guidance services</b> made available to students upon enrolment are tailored to the skills and modality of the degree and facilitate the teaching-learning process.	B. Achieved
5.5	In the event that the degree provides for the performance of <b>external internships</b> , these have been planned as that foreseen and are suitable for the acquisition of the skills of the degree.	A. Passed with excellence
5.6	The university has made effective the <b>commitments</b> included in the verification report and the <b>recommendations</b> defined in the verification, authorisation, if any, and degree follow-up reports regarding the support personnel participating in the training activities, the material resources, and the degree support services.	NA - Not Applicable

#### Evaluation criterion 5: B. Achieved

Information on the financial and economic activities of RUDN University is available in Russian at <http://www.rudn.ru/sveden/budget>.

Information on classrooms and facilities equipped for practical training, including those adapted for physically disabled people, is available on the main site of RUDN University <http://www.rudn.ru/sveden/objects>. This information is presented in Russian too.

There is an inventory of facilities that shows the adequacy of the equipment: computer and software laboratories, rooms for independent work, Scientific and Educational Information Library (at <http://eng.rudn.ru/education/library/>), etc.

We strongly recommend the improvement of the English version of these webpages. Given the international outlook of RUDN University, showing accessible information for stakeholders who do not speak Russian is fundamental-

There is no specific evidence of a student guidance office although the students consulted show a very positive regard towards the guidance they receive from faculty members.

International students do receive guidance through one of the four regional centres. They are offered Russian language classes and academic support in certain subjects. They are also encouraged to interact in multicultural environments.

Although some students report that they chose the RUDN University because of its international environment and the good opportunities it offers to go abroad, mobility is focused on external internships (21 ECTS) and are obtained by students through bilateral agreements established by the University. The Department for Internships and Employment is responsible for monitoring the process of organising these internships and finding employment for students and graduates, whether Russian or international. This department works in a highly efficient way and the students are very satisfied with the job opportunities they receive.

We recommend the establishment of a student mobility support service to encourage and manage internal mobility (among universities in the Russian Federation) and international mobility.

It is also recommended that a training plan be set up for administrative and service staff.

### DIMENSION 3. RESULTS

#### Criterion 6. LEARNING RESULTS

The learning results achieved by the graduates are consistent with the graduation profile and correspond to the academic level of the degree.

6.1	The <b>training activities</b> , their <b>teaching methodologies</b> and the <b>evaluation systems</b> used are appropriate and reasonably consistent with the objective of acquiring the intended learning results.	B. Achieved
6.2	The <b>learning results achieved</b> meet the objectives of the training programme and are appropriate to the corresponding academic level.	A. Passed with excellence

#### Evaluation criterion 6: A. Passed with excellence

There is a Methodological Commission that provides methodological support to the teaching staff and establishes guidelines for the evaluation of students. There are Regulations for Continuous Assessment (<http://quality.rudn.ru/file.php?id=335>) and Regulations for Final Assessment (<http://quality.rudn.ru/file.php?id=340>). Continuous assessment is worth 60% of the final mark and the final exam is the other 40%. This committee is also responsible for carrying out horizontal and vertical coordination.

Training activities, teaching methodologies and evaluation systems are considered to be adequate.

The learning results are excellent and respond to the existing demand for professionals who are able to use mathematical tools with sufficient knowledge to be able to apply them in diverse and multidisciplinary areas.

The areas of employment for graduates are very diverse. Some employers assure that graduates show a high level of fundamental mathematics, whereas others emphasize that they can do computer programming and research at the same time, being capable of learning how to use new, specific software in a remarkably short time. The good level of English of the graduates has also been highlighted.

All employers confirm their satisfaction with the work carried out by the graduates.

### Criterion 7. SATISFACTION AND PERFORMANCE INDICATORS

The results of the indicators of the training programme are consistent with the design, management and resources made available for the degree and satisfy the social demands of their environment.

7.1	The <b>evolution of the main data and indicators of the degree</b> (number of new students per academic year, graduation rate, drop-out rate, efficiency rate, performance rate and success rate) is appropriate, according to the thematic area and environment in which the degree is inserted and is consistent with the characteristics of the new students.	B. Achieved
7.2	The <b>satisfaction</b> of the students, faculty, graduates and other stakeholders is adequate.	A. Passed with excellence
7.3	The values of the indicators of <b>labour market insertion</b> of the graduates of the degree are appropriate to the socio-economic and professional context of the degree.	A. Passed with excellence

#### Evaluation criterion 7: A. Passed with excellence

The academic indicators show a favourable evolution of results in the last four years. The only exception to this positive trend is the number of new students with an enrolment of 15, 14, 9 and 10 students. The dropout rate is around 20%, which could be considered slightly high for the Master's level degree.

Although dropouts and delays in graduation have been explained to be due to personal situations, unrelated to the Master's degree itself, and these results are expected to improve significantly, attention should be paid to the evolution of these indicators.

The Quality Assurance Service carries out general satisfaction surveys once a year. It also carries out other more specific surveys aimed at specific groups or subjects. There is no data in a disaggregated way for each individual Master's degree, resulting in the lack of specific information. It is recommended that specific surveys be carried out to find out the opinion of the students of the Master's programme or that an individual analysis be made of the group of surveys of the students of the Master's programme.

Despite this, it is worth noting that the students interviewed show a high level of satisfaction with the University and with the teachers of the Master's degree.

Although there is no formal procedure in place to control labour market insertion, there is a general perception that there is no unemployment among graduates and that students enter the labour market quickly. The support service (Department for Internships and Employment) in collaboration with the faculty is responsible for helping students to maximise their employability potential.

The chair of the international expert panel

Professor Celso Rodríguez

## ANNEX I

### INTERNATIONAL EXPERT PANEL

**Celso RODRÍGUEZ (Chair):** Professor for Mathematics at the Universidad of Santiago de Compostela (USC). He has been Dean at the Faculty of Mathematics and Vice-President for Academic Affairs at USC. Expert and reviewer for the Portuguese national agency A3ES and several Spanish agencies. Chair of the ACPUA committee for evaluation of study programmes in Sciences.

**Olga YUSUPOVA (Academic Staff):** Doctor of Education, Vice-Rector for Academic Affairs, Head of the Department of Higher Mathematics, Samara State Technical University, Associate Professor.

**Ernesto ESTRADA (Practitioner):** Senior Researcher, Aragon Foundation for Research and Development (ARAID). Member of the Institute for Applied Mathematics (IUMA), University of Zaragoza. Honorary Research Professor, Department of Mathematics and Statistics, University of Strathclyde (2018). PhD in Chemistry, Central University of Las Villas, Cuba. Elected SIAM Fellow (2019), Elected Full Member of the International Academy of Mathematical Chemistry (2005), National Prize of the Cuban Academy of Science (1998). Industrial collaborations with Weir Oil and Gas, Isochron Ltd., 12 Ltd. and others.

**Diego J. SÁNCHEZ (Student member):** Double Degree in Physics and Mathematics from the Complutense University of Madrid. Member of the Advisory Committee of the Agency Unibasq. Member of the ACPUA's Evaluation Committee for accreditation of study programmes in Sciences. National Award to the Best High School Student 2014.

### AGENDA – VIRTUAL VISIT

**Date:** 30/11/2020

**7:30-7:45: Checking the stability of internet connection**

**7:45-8:00: Internal meeting of the expert panel**

**8:00-9:15: Institutional presentation for all panels. Meeting with representatives of the university management and quality assurance department.**

- Vorobyova Aalexandra, Head of the Department of Educational Policy.
- Podolko Pavel, Director of the Department for Quality Assurance of Educational Programs.
- Lyubkina Tatyana, Head of the Education Quality Management Sector.
- Ismagilova Anastasia, Specialist in Educational and Methodological Work and Quality of Education.
- Timur Usmanov, Department of Organization of Practices and Employment of Students.

**DATE:** 02/12/2020

**12:15-12:30: Checking the stability of internet connection**

**12:30-13:00: Open Session**

**13:00-14:00: Lunch time**

**14:00-14:15: Checking the stability of internet connection**

**14:15-15:00: Coordinators**

- Alexander Skubachevsky, Director of the Mathematical Institute.
- Darya Neverova, Assistant.

**15:00-15:15: Internal meeting of the expert panel**

**15:15-15:30: Checking the stability of internet connection**

**15:30-16:15: Teaching Staff**

- Alexey Ivanyukhin, Associate Professor.
- Galina Lazareva, Professor.
- Leonid Rossovsky, Professor.
- Natalia Anosova, Senior Lecturer.
- Irina Kolesnikova, Senior Lecturer.
- Alexey Tokarev, Associate Professor.
- Vladimir Popov, Associate Professor.

**16:15-16:30: Internal meeting of the expert panel**

**16:45-17:00: Checking the stability of internet connection**

**16:45-17:30: Meeting with students and graduates of the programme**

Students (1-2 Years)

- Olga Silhankova, 2nd Year Student.
- Viktor Kruglov, 2nd Year Student.
- Ruben Karamyan, 1st Year Student.
- Kristina Ryumina, 1st Year Student.

Graduates

- Natalia Izvarina, 2019.
- Konstantin Zhuikov, 2019.
- Alexey Lobanov, 2020.
- Amina Adhamova, 2018.

**17:30-17:45: Internal meeting of the expert panel**

**17:45-18:00: Checking the stability of internet connection**

**18:00-18:45: Meeting with Employers**

- Anna Sushkova, Ooo "Hi-Tech", Hr-Director.
- Polina Semeniuk, Ooo "Yves Kognitiv", Recruitment Manager.
- Evgeny Varfolomeev, Ooo "Fors-Development Center", Web-Developer.
- Svetlana Reznichenko, Gk "Software Product", Recruitment Manager.
- Andrey Christophorov, Ooo "Smart Konstrakshin", Head of Direction.

- Andrey Muravnik, Magazine "Modern Mathematics. Fundamental Directions", Editor and Translator.

**18:45-19:15: Internal meeting of the expert panel**

**19:15-19:30: Checking the stability of internet connection**

**19:30-20:00: Final meeting with programme coordinators**

- Alexander Skubachevsky, Director of the Mathematical Institute.
- Darya Neverova, Assistant.

**20:00-20:15: Internal meeting of the expert panel**