Annex No. 3

The External Evaluation Report of a Doctoral Study Domain

Contents

I. Introduction[1]

In this chapter, the following shall be summarized:

- the context in which this external evaluation report was drafted (**the type of evaluation, the period of the evaluation visit, the composition of the Experts Committee** etc.);
- details about the doctoral school(s) of which the doctoral domain under review is part (number of doctoral advisors, number of students, institutional context, short history etc.);
- details about the doctoral study domain under review (number of students, institutional context, short history etc.).

The present External Evaluation Report is based on the Self Assessment Report on the Doctoral Field in Mathematics provided by the University Politehnica of Bucharest, several online meetings with employers' respresentatives, members of the school council / doctoral schools (CSD) members, PhD students, PhD supervisors, old graduate students, etc. Due to the present COVID-19 scenario, it is not possible for the external evatulator to visit the Department / University. In the Expert Committee for Mathematics, there are three members, Prof. Dr. Vasile Berinde (internal), Prof. Dr. Qamrul Hasan Ansari (External) (My self) and Alexandra-Maria Chiper (PhD student).

Doctoral School of Applied Sciences has two domains of doctoral studies, Physics and Mathematics. There are 22 PhD supervisors (10 in Mathematics and 12 in Physics). As mentioned in the Self Assessment Report, Doctoral School of Applied Sciences has very high aims and objectives. It aims to create a high-performance environment for academic training at the highest level of students – highly qualified PhD students. Both the domains, Physics and Mathematics, have a wide range of current / hot research areas. A reasonal number of PhD students received PhD degree during the last five years. As mentioned in the Self

[1] *Each time when applicable the information shall be presented gender-wise.*

Assessment Report, both the domains, Physics and Mathematics, have modern and well equipped laboratories and computing facilities.

The Mathematics Department has ten doctoral advisors and 19 PhD students with half of them getting study grant. As I know perosnally, some of PhD advisors are renowned researchers. They have wide specturum of research area and working in the current / hot topics in mathematics.

II. Methods used

This chapter will contain the methods and tools used in the external evaluation process, before and during the evaluation visit, including at least:

• The analysis of the internal evaluation report of the doctoral study domain under review and its Annexes;

• The analysis of documents made available by the IOSUD, in physical format, during the evaluation visit (if such documents have been requested);

• The analysis of documents, data and information available on the IOSUD/Doctoral School(s) website, in electronic format;

• Visiting the buildings included in the institution's property, comprising (indicative and non- exhaustive list, which shall be changed according to the context):

- classrooms;
- laboratories;
- the institution's library;
- research centers;
- the Career Counselling and Guidance Center;
- lecture halls for students;
- the student residences;
- the student cafeteria;
- sports ground etc.;

• Meeting/discussions with doctoral students in the doctoral study domain under review;

• Meeting/Discussions with the graduates of the doctoral study domain under review;

• Meeting/Discussions with employers of the graduates in the doctoral study domain under review;

• Meeting/Discussions with the school officials of the Doctoral School(s) in which the doctoral study domain under review is operating;

• Meeting/Discussions with the doctoral advisors in the doctoral study domain under review;

• Meeting/discussions with the representatives of the various structures of the IOSUD/Doctoral School(s) in which the doctoral study domain under review is operating:

- The Council of the Doctoral School, the University Senate, the Board of Directors, the Quality Assessment and Assurance Commission, the Quality Assurance Department, the Ethics Commission (including with the student representatives of these structures);
- the Career Counselling and Guidance Center;
- student organizations;
- secretariats;
- various departments/administrative offices (Social/Student residences-Cafeterias etc.);

- Application of questionnaires to doctoral students or academic staff in the doctoral study domain under review.

The method of evaluation is used as prescribed by the ARACIS. It is based on the Self Assessment Report and several online meetings with employers' respresentatives, members of the school council / doctoral schools (CSD) members, PhD students, PhD supervisors, old graduate students, etc. Due to the present COVID-19 senero, it is not possible for the external evatulator to visit the Department / University.

During the discussion with several online meetings, it is found that almost all the students are very much satisfied with the facilities provided by the university. No old student had any complaint about the facilities in the university. Most of the students are very much safisfied with their PhD advisor and working in the hot / current topic in their field.

III. Analysis of ARACIS's performance indicators

Domain A. INSTITUTIONAL CAPACITY

**general description of domain analysis.*

The University Politehnica of Bucharest (UPB) has a long history of its establishment and development. It has been recognized for advanaced research with high quality and visivility, high quality of teaching, excellence of study programs, etc, and achieved the first category (A) ranking for all study progams. In 2015, following the evaluation of the Romanian Agency for Quality Assurance in Higher Education, UPB obtained the reconfirmation of accreditation with a high degree of trust. Its mission and objectives, including general and scientific objectives, are very high as mentioned in the Self Assessment Report.

Criterion A.1. The administrative, managerial institutional structures and the financial resources

**general description of the criterion analysis.*

The University Politehnica of Bucharest (UPB) is well organized and operates based of its own regulations, methodologies and procedures developed in accordance with national regulations and legislation. The UPB also has the necessary logistics to fulfill its mission and objectives through the existence of an IT system to monitor the academic path of doctoral students and through the existence of a software to verify similarities. The financial resources of the university are used optimally so that doctoral school activities take place in good conditions.

Standard A.1.1. The institution organizing doctoral studies (IOSUD) has implemented the effective functioning mechanisms provided for in the specific legislation on the organization of doctoral studies.

**general description of the standard analysis.*

The University Politehnica of Bucharest (UPB) is well organized and operates based of its own regulations, methodologies and procedures developed in accordance with national regulations and legislation. They are published on the universities' website and regularly updated so that they can be in line with existing legislation.

Performance Indicator A.1.1.1. *The existence of specific regulations and their application at the level of the Doctoral School of the respective university doctoral study domain:*

(a) the internal regulations of the Doctoral School;

(b) the Methodology for conducting elections for the position of director of the Council of doctoral school (CSD), as well as elections by the students of their representative in CSD and the evidence of their conduct;

c) the Methodologies for organizing and conducting doctoral studies (for the admission of doctoral students, for the completion of doctoral studies);

d) the existence of mechanisms for recognizing the status of a Doctoral advisor and the equivalence of the doctoral degree obtained abroad;

e) functional management structures (Council of the doctoral school), giving as well proof of the regularity of meetings;

f) the contract for doctoral studies;

g) internal procedures for the analysis and approval of proposals regarding the training for doctoral study programs based on advanced academic studies.

- description of the facts, the findings from the assessed institution's documents and the
evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator A.1.1.2. *The doctoral school' Regulation includes mandatory criteria, procedures and standards binding on the aspects specified in Article 17, paragraph (5) of the Government Decision No. 681/2011 on the approval of the Code of Doctoral Studies with subsequent amendments and additions.*

- description of the facts, the findings from the assessed institution's documents and the
evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation
visit itself

Recommendations:

The indicator is fulfilled

Standard A.1.2. The IOSUD has the logistical resources necessary to carry out the doctoral studies'
mission.

**general description of the standard analysis.*

According to the online meetings with the studtents, all possible facilities to do high quality of research work are available in the university. Therefore, we may assume that the IOSUD has the logistical necessary resources to carry out doctoral studies' mission.

Performance Indicator A.1.2.1. *The existence and effectiveness of an appropriate IT system to keep track of doctoral students and their academic background.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation*

visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator A.1.2.2. *The existence and use of an appropriate software program and evidence of its use to verify the percentage of similarity in all doctoral theses.*

- *description of the facts, the findings from the assessed institution's documents and the*

evaluation visit itself

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation*

visit itself

Recommendations:

The indicator is fulfilled

Standard A.1.3. The IOSUD makes sure that financial resources are used optimally, and the revenues obtained from doctoral studies are supplemented through additional funding besides governmental funding.

**general description of the standard analysis.*

It seems that the UPB has its own mechanisium to make sure that the financial resouces are used optinally, and the revenues obtained from doctoral studies are supplemented.

Performance Indicator A.1.3.1. *Existence of at least one research or institutional / human resources development grant under implementation at the time of submission of the internal evaluation file, per doctoral study domain under evaluation, or existence of at least 2 research or institutional development / human resources grant for the doctoral study domain, obtained by doctoral thesis advisors operating in the evaluated domain within the past 5 years. The grants address relevant themes for the respective domain and, as a rule, are engaging doctoral students.*

- *description of the facts, the findings from the assessed institution's documents and the*

evaluation visit itself

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation*

visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator *A.1.3.2. *The percentage of doctoral students active at the time of the evaluation, who for at least six months receive additional funding sources besides government funding, through scholarships awarded by individual persons or by legal entities, or who are financially supported through research or institutional / human resources development grants is not less than 20%.*

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself*
- *analysis of the facts, the findings from the assessed institution's documents and the*

evaluation visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator *A.1.3.3.[2] *At least 10% of the total amount of doctoral grants obtained by the university through institutional contracts and of tuition fees collected from the doctoral students enrolled in the paid tuition system is used to reimburse professional training expenses of doctoral students (attending conferences, summer schools, training, programs abroad, publication of specialty papers or other specific forms of dissemination etc.).*

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself*
- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*

Recommendations:

The indicator is fulfilled

Criterion A.2. Research infrastructure

**general description of the criterion analysis.*

The Mathematics Department has several research laboratories with computer network, wireless internet accesss, printers, copiers, consumable items, BNs 005 (POSDRU ID 32768), etc. It also has a Computational Mathematics and Graphics Visualization Laboratory for high mathematical computing and graphics. Besides these laboratories, UPB has a Central Library (BC-UPB) whose resources are available online through the ALEPH application. A large number of mathematical books, journals and other magazines are available online.

Standard A.2.1. The IOSUD has a modern research infrastructure to support the conduct of doctoral
studies' specific activities.

**general description of the standard analysis.*

Through the BC-UPM website, all current subscriptions to Romanian and foreign scientific publication can be reached. Some libraries of other universities can also be accessed through BC-UPM website. The UPB provides free online access to scientific database through the ANELIS-Plus project. Free Internet is also provided to each room of the students dormitory.

[2] The indicators marked with an asterisk (*) hold a special status, referring exclusively to the evaluation of doctoral studies domains, as per Article 12 from the annex No.1 of the Order of the minister of education No. 3651/12.04.2021 approving the Methodology for evaluating university doctoral studies and the system of criteria, standards and performance indicators used in the evaluation. In case they are not met, the Agency extends a period of maximum 3 years to IOSUD to correct the respective deficiencies.

Performance Indicator A.2.1.1. *The venues and the material equipment available to the doctoral school enable the research activities in the evaluated domain to be carried out, in line with the assumed mission and objectives (computers, specific software, equipment, laboratory equipment, library, access to international databases etc.). The research infrastructure and the provision of research services are presented to the public through a specific platform. The research infrastructure described above, which was purchased and developed within the past 5 years will be presented distinctly.*

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself*
- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*

Recommendations:

The indicator is fulfilled

Criterion A.3. Quality of Human Resources

**general description of the criterion analysis.*

There are 10 PhD supervisors in the Mathematics Domain with different wide range of specializations. Out of 10 PhD supervisiors, more than 12 are very good in their field of specilaization. However, some are excellent and well known in their specialization.

Standard A.3.1. At the level of each domain there are sufficient qualified staff to ensure the conduct of doctoral study program.

**general description of the standard analysis.*

Department of Mathematics has sufficient well qualified staff to ensure the conduct of doctoral study program.

Performance Indicator A.3.1.1. *Minimum three doctoral thesis advisors within that doctoral domain, and at least 50% of them (but no less than three) meet the minimum standards of the National Council for Attestation of University Degrees, Diplomas and Certificates (CNATDCU) in force at the time when the evaluation is carried out, which standards are required and mandatory for obtaining the enabling certification.*

- *description of the facts, the findings from the assessed institution's documents and the*

evaluation visit itself

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation*

visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator *A.3.1.2. *At least 50% of all doctoral advisors have a full-time employment contract for an indefinite period with the IOSUD.*

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself*
- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*

Recommendations:

The indicator is fulfilled

Performance Indicator A.3.1.3. *The study subjects in the education program based on advanced higher education studies pertaining to the doctoral domain are taught by teaching staff or researchers who are doctoral thesis advisors / certified doctoral thesis advisors, professors / CS I or lecturer / CS II, with proved expertise in the field of the study subjects they teach, or other specialists in the field who meet the standards established by the institution in relation with the aforementioned teaching and research functions, as provided by the law.*

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself*
- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*

Recommendations:

The indicator is fulfilled

Performance Indicator *A.3.1.4. *The percentage of doctoral thesis advisors who concomitantly coordinate more than 8 doctoral students, but no more than 12, who are themselves studying in doctoral programs[3] does not exceed 20%.*

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself*
- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*

Recommendations:

The indicator is fulfilled

Standard A.3.2. The Doctoral advisors within the domain are carrying out a scientific activity visible at international level.

**general description of the standard analysis.*

Time to time, Department of Mathematics organizes symposia / conferences which carry out scientific activities by the department in general and by the doctoral advisors in particular at international level. The Doctoral advisors also encoyrage to their students to participate in International Conferences and to present their work in these conferences.

Performance Indicator A.3.2.1. *At least 50% of the doctoral thesis advisors in the evaluated domain have at least 5 Web of Science- or ERIH-indexed publications in magazines of impact, or other achievements of relevant significance for that domain, including international-level contributions that indicate progress in scientific research - development - innovation for the evaluated domain. The aforementioned doctoral thesis advisors enjoy international awareness within the past five years, consisting of: membership on scientific boards of international publications and conferences; membership on boards of international professional associations; guests in conferences or expert groups working abroad, or membership on doctoral defense commissions at universities abroad or co-leading with*

[3] *3 years for the doctoral university studies with the duration stipulated at Article 159, paragraph (3), respectively 4 years for the doctoral university studies with the duration stipulated at Article 174, paragraph (3) of the Law of national education No.1/2011 with subsequent amendments and additions, with additional extension periods approved as per Article 39, paragraph (3) of the Code of doctoral studies approved by the GD No. 681/2011 with subsequent amendments and additions.*

universities abroad. For Arts and Sports and Physical Education Sciences, doctoral thesis advisors shall prove their international visibility within the past five years by their membership on the boards of professional associations, membership in organizing committees of arts events and international competitions, membership on juries or umpire teams in artistic events or international competitions.

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator *A.3.2.2. *At least 50% of the doctoral thesis advisors in a specific doctoral study domain continue to be active in their scientific field, and acquire at least 25% of the score requested by the minimal CNATDCU standards in force at the time of the evaluation, which are required and mandatory for acquiring their enabling certificate, based on their scientific results within the past five years.*

- *description of the facts, the findings from the assessed institution's documents and the*

evaluation visit itself

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*

Recommendations:

The indicator is fulfilled

Domain B. EDUCATIONAL EFFECTIVENESS

**general description of domain analysis.*

During the PhD course, all students, under the coordination of scientific leaders, develop the skill to publish their work as scientifc research publication in WOS / ISI, BDI journals. All PhD students are encouage to participate and to present their research work in national / international conference / workshops.

Criterion B.1. The number, quality and diversity of candidates enrolled for the admission contest

**general description of the criterion analysis.*

The Mathematics Department has 10 well qualified supervisors in the different and hot / current areas to guide the PhD students. There are eight foreign PhD students in Mathematics. Of course, all foreign students are supposed to write their thesis in English. 44% of completed theses were written in English. Mixed number of male and female candidates are enrolled in PhD program in mathematics.

Standard B.1.1. The institution organizing doctoral studies has the capacity to attract candidates from outside the higher education institution or a number of candidates exceeding the number of seats available.

*general description of the standard analysis.

As mentioned in the Self Assessment Report, more than 50% PhD students are from outside of the university. Not only this, the department in particular and university in general attract many international students. It is because of the high standard of the PhD advisors available in the Department of Mathematics.

***Performance Indicator *B.1.1.1.** The ratio between the number of graduates of masters' programs of other higher education institutions, national or foreign, who have enrolled for the doctoral admission contest within the past five years and the number of seats funded by the state budget, put out through contest within the doctoral domain is at least 0.2 or the ratio between the number of candidates within the past five years and the number of seats funded by the state budget put out through contest within the doctoral studies domain is at least 1,2.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Standard B.1.2 Candidates admitted to doctoral studies demonstrate academic, research and professional performance.

general description of the standard analysis.

As mentioned in the Self Assessment Report and also mentioned by the PhD students during online meeting, every PhD student has to publish at least one SCI journal paper. Such activity demonstarte academic, research and professonal performance of the PhD student.

***Performance Indicator *B.1.2.1.** Admission to doctoral study programs is based on selection criteria including: previous academic, research and professional performance, their interest for scientific or arts/sports research, publications in the domain and a proposal for a research subject. Interviewing the candidate is compulsory, as part of the admission procedure.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation isit itself

Recommendations:

The indicator is fulfilled

***Performance Indicator B.1.2.2.** The expelling rate, including renouncement / dropping out of doctoral students 3, respectively 4, years after admission[4] does not exceed 30%.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*

Recommendations:

The indicator is fulfilled

Criterion B.2. The content of doctoral programs

**general description of the criterion analysis.*

Most of the PhD advisors are working on the current / hot topics in their field. There are two components of course work in the PhD program and other contents of the doctoral program are similar to other universities in the world.

Standard B.2.1. The training program based on advanced university studies is appropriate to improve doctoral students' research skills and to strengthen ethical behavior in science.

**general description of the standard analysis.*

As mentioned by the PhD students during online meeting, sometime they have group discussion in their research group with their PhD advisors. PhD advisors give some scientific research training to their doctoral students.

Performance Indicator B.2.1.1. *The training program based on advanced academic studies includes at least 3 disciplines relevant to the scientific research training of doctoral students; at least one of these disciplines is intended to study in-depth the research methodology and/or the statistical data processing.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator B.2.1.2. *At least one discipline is dedicated to Ethics and Intellectual Property in scientific research or there are well-defined topics on these subjects within a discipline taught in the doctoral program.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:
The indicator is fulfilled

Performance Indicator B.2.1.3. *The IOSUD has mechanisms to ensure that the academic training program based on advanced university studies addresses „the learning outcomes", specifying the knowledge, skills, responsibility and autonomy that doctoral students should acquire after completing each discipline or through the research activities*[5]

[4] 3 years for the doctoral university studies with the duration stipulated at Article 159, paragraph (3), respectively 4 years for the doctoral university studies with the duration stipulated at Article 174, paragraph (3) of the Law of national education No. 1/2011 with subsequent amendments and additions.

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- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator B.2.1.4. *All along the duration of the doctoral training, doctoral students in the domain receive counselling/guidance from functional guidance commissions, which is reflected in written guidance and feedback or regular meeting.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator B.2.1.5*. For a doctoral study domain, the ratio between the number of doctoral students and the number of teaching staff/researchers providing doctoral guidance must not exceed 3:1.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Criterion B.3. The results of doctoral studies and procedures for their evaluation.

**general description of the criterion analysis.*

As a result of the doctoral studies, students learn the skill of research as well as teaching. They publish atleast one SCI journal paper. The evatuation process is similar to the other universities of the world.

Standard B.3.1. Doctoral students capitalize on the research through presentations at scientific conferences, scientific publications, technological transfer, patents, products and service orders.

**general description of the standard analysis.*

[5] Or by what the graduate should know, understand and to be able to do, according to the provisions of the Methodology of 17 March 2017 regarding inscription and registration of higher education qualifications in the National Register of Qualifications in Higher Education (RNCIS) approved by the Order No.3475/2017 with subsequent amendments and additions.

Most, but not all, students present their work in the international conferences. Several PhD students are wotking in some organizations and it is not possible for them to participate in the conferences outside the country. That's why, they are unable to present tehir work in international conferences. It is necessary for PhD student to publish atleast one research paper in SCI journal. Students' work is also visible on the SDSA.

Performance Indicator B.3.1.1. *For the evaluated domain, the evaluation commission will be provided with at least one paper or some other relevant contribution per doctoral student who has obtained a doctor's title within the past 5 years. From this list, the members of the evaluation commission shall randomly select 5 such papers / relevant contributions per doctoral study domain for review. At least 3 selected papers must contain significant original contributions in the respective domain.*

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself analysis of the facts, the findings from the assessed institution's documents and the evaluation* visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator *B.3.1.2. *The ratio between the number of presentations of doctoral students who completed their doctoral studies within the evaluated period (past 5 years), including posters, exhibitions made at prestigious international events (organized in the country or abroad) and the number of doctoral students who have completed their doctoral studies within the evaluated period (past 5 years) is at least 1.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Standard B.3.2. The Doctoral School engages a significant number of external scientific specialists in the commissions for public defense of doctoral theses in the analyzed domain.

**general description of the standard analysis.*

There is one external examiner to evaluate the PhD thesis.

Performance Indicator *B.3.2.1. *The number of doctoral theses allocated to one specialist coming from a higher education institution, other than the evaluated IOSUD should not exceed two (2) in a year for the theses coordinated by the same doctoral thesis advisor.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator *B.3.2.2. *The ratio between the doctoral theses allocated to one scientific specialist coming from a higher education institution, other than the institution where the defense on the doctoral thesis is organized, and the number of doctoral theses presented in the same doctoral study domain in the doctoral school should not exceed 0.3, considering the past five years. Only those doctoral study domains in which minimum ten doctoral theses have been presented within the past five years should be analyzed.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Domain C. QUALITY MANAGEMENT

**general description of domain analysis.*

By the approval of UPB Senate, the Quality Assessment and Assurance Commission (CEAC) is established according to the law. The CEAC prepares the annual internal evaluation report, suggest some proposal to improve the quality of education and then submit it to the UPB Senate for the approval.

Criterion C.1. Existence and periodic implementation of the internal quality assurance system

**general description of the criterion analysis.*

The UPB in general and Department of Mathematics in particular take everal measures for the existence and periodic implementation of the internal quality assurance, namely, evaluation of PhD supervisors at department level by analyzing the scientific work as well as by the students.

Standard C.1.1. There are an institutional framework and procedures in place and relevant internal quality assurance policies, applied for monitoring the internal quality assurance.

**general description of the standard analysis.*

The mathematics PhD field is annually evaluated according to the procedures developed at thelevel of the Doctoral School and IOSUD.

Performance Indicator C.1.1.1. *The Doctoral school in the respective university study domain shall demonstrate the continuous development of the evaluation process and its internal quality assurance following a procedure developed and applied at the level of the IOSUD, the following assessed criteria being mandatory:*

(a) the scientific work of Doctoral advisors;

(b) the infrastructure and logistics necessary to carry out the research activity;

(c) the procedures and subsequent rules based on which doctoral studies are organized;

d) the scientific activity of doctoral students;

e) the training program based on advanced academic studies of doctoral students;

f) social and academic services (including for participation at different events, publishing papers etc.) and counselling made available to doctoral students.

- description of the facts, the findings from the assessed institution's documents and

the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator *C.1.1.2. *Mechanisms are implemented during the stage of the doctoral study program to enable feedback from doctoral students allowing to identify their needs, as well as their overall level of satisfaction with the doctoral study program in order to ensure continuous improvement of the academic and administrative processes. Following the analysis of the results, there is evidence that an action plan was drafted and implemented.*

- *description of the facts, the findings from the assessed institution's documents and the*

evaluation visit itself

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation*

visit itself

Recommendations:

The indicator is fulfilled

Criterion C.2. Transparency of information and accessibility of learning resources

**general description of the criterion analysis.*

Without transparency of information and accessibility of learning resources no institution can grow and establish its reputation. It should contain the procedure to induct PhD students, their topics, and abstract of theses, etc. All such ceriterion are followed by the Department of Mathematics in particular and UPB in general.

Standard C.2.1. Information of interest to doctoral students, future candidates and public interest information is available for electronic format consultation.

**general description of the standard analysis.*

It is very imporatnt to upload the PhD theses of the PhD students on the website of the university or the department. It seems that the UPB in general and mathematics domain in particularly follow this ceriteria.

Performance Indicator C.2.1.1. *The IOSUD publishes on the website of the organizing institution, in compliance with the general regulations on data protection, information such as:*

(a) the Doctoral School regulation;

(b) the admission regulation;

(c) the doctoral studies contract;

(d) the study completion regulation including the procedure for the public presentation of the thesis

(e) the content of training program based on advanced academic studies;

(f) the academic and scientific profile, thematic areas/research themes of the Doctoral advisors within the domain, as well as their institutional contact data

(g) the list of doctoral students within the domain with necessary information (year of registration; advisor);

(h) information on the standards for developing the doctoral thesis;

(i) links to the doctoral theses' summaries to be publicly presented and the date, time, place where they will be presented; this information will be communicated at least twenty days before the presentation.

- *description of the facts, the findings from the assessed institution's documents and the*

evaluation visit itself

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation*

visit itself

Recommendations:

The indicator is fulfilled

Standard C.2.2. The IOSUD/The Doctoral School provides doctoral students with access to the resources needed for conducting doctoral studies.

**general description of the standard analysis.*

As mentioned in the self assessment report, all PhD students can access all resources avaiable at the university level and even they can accsess such resouces from outside of the university server.

Performance Indicator C.2.2.1. *All doctoral students have free access to one platform providing academic databases relevant to the doctoral studies domain of their thesis.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator C.2.2.2. *Each doctoral student shall have access, upon request, to an electronic system for verifying the degree of similarity with other existing scientific or artistic works.*

- descryiption of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator C.2.2.3. *All doctoral students have access to scientific research laboratories or other facilities depending on the specific domain/domains within the Doctoral School, according to internal order procedures.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Criterion C.3. Internationalization

**general description of the criterion analysis.*

The parameters given under this item are essential to internationalize the doctoral studies. Attending the international conferences or workshop, working in international projects, inviting internationally known experts to give a series of talks on the current and hot topics, etc are very important for the PhD students for their exposers. Some how here is a small drawback in this direction in UPB.

Standard C.3.1. There is a strategy in place and it is applied to enhance the internationalization of doctoral studies.

**general description of the standard analysis.*

The indicators given below can be applied to enhance the internationalization of doctoral studies.

Performance Indicator *C.3.1.1. *IOSUD, for every evaluated domain, has concluded mobility agreements with universities abroad, with research institutes, with companies working in the field of study, aimed at the mobility of doctoral students and academic staff (e.g., ERASMUS agreements for the doctoral studies). At least 35% of the doctoral students have completed a training course abroad or other mobility forms such as attending international scientific conferences. IOSUD drafts and applies policies and measures aiming at increasing the number of doctoral students participating at mobility periods abroad, up to at least 20%, which is the target at the level of the European Higher Education Area.*

- *description of the facts, the findings from the assessed institution's documents and the*

evaluation visit itself

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*

Recommendations:

The indicator is partially fulfilled

Performance Indicator C.3.1.2. *In the evaluated doctoral study domain, support is granted, including financial support, to the organization of doctoral studies in international co-tutelage or invitation of leading experts to deliver courses/lectures for doctoral students.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself
- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled

Performance Indicator C.3.1.3. *The internationalization of activities carried out during the doctoral studies is supported by IOSUD through concrete measures (e.g., by participating in educational fairs to attract international doctoral students; by including international experts in guidance committees or doctoral committees etc.).*

- description of the facts, the findings from the assessed institution's documents and

the evaluation visit itself

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself

Recommendations:

The indicator is fulfilled.

IV. SWOT Analysis

Strengths:	**Weaknesses:**
The domain of mathematics has a very good team of PhD supervisors. Some of them are very well known and renowned mathematicians.	The domain of mathematics does not have enough international collaboration in terms of PhD co-supervisor, international projects, etc.
Opportunities:	**Threats:**
To get the international recognition, it is very import to have some international collaboration. Passout PhD students may get the Postdoctoral fellowship outside Romania.	No threat.

V. Overview of judgments awarded and of the recommendations

No.	Type of indicator (*, C)	Performance indicator	Judgment	Recommendations
1		A.1.1.1	satisfied	
2		A.1.1.2	satisfied	
3		A.1.2.1	satisfied	
4		A.1.2.2	satisfied	
5		A.1.3.1	satisfied	
6	*	A.1.3.2	satisfied	
7	*	A.1.3.3	satisfied	
8	C	A.2.1.1	satisfied	
9	C	A.3.1.1	satisfied	
10	*	A.3.1.2	satisfied	
11		A.3.1.3	satisfied	
12	*	A.3.1.4	satisfied	
13	C	A.3.2.1	satisfied	

14	*	A.3.2.2	satisfied	It is recommended to attract young and active PhD supervisors
15	*	B.1.1.1	satisfied	
16	*	B.1.2.1	satisfied	
17		B.1.2.2	satisfied	It is recommended to attract foreign PhD students
18		B.2.1.1	satisfied	
19		B.2.1.2	satisfied	
20		B.2.1.3	satisfied	
21		B.2.1.4	satisfied	
22	C	B.2.1.5	satisfied	
23	C	B.3.1.1	satisfied	
24	*	B.3.1.2	satisfied	
25	*	B.3.2.1	satisfied	
26	*	B.3.2.2	satisfied	
27		C.1.1.1	satisfied	
28	*	C.1.1.2	satisfied	
29	C	C.2.1.1	satisfied	
30		C.2.2.1	satisfied	
31		C.2.2.2	satisfied	
32		C.2.2.3	satisfied	
33	*	C.3.1.1	partially satisfied	
34		C.3.1.2	satisfied	It would be better to have some foreign co-supervisor
35		C.3.1.3	satisfied	

VI. Conclusions and general recommendations

I would like to suggest that there should be more international exposure of the PhD students in comparison with existing ones. PhD supervisors may invite some international co-supervisor for their PhD students. Some International experts can be invited to give a series of talks on hot topics in the area of PhD students.

VII. Annexes

The following types of documents are attached:

- *The detailed schedule of the evaluation visit – MANDATORY.*
- *Scanned documents – any document requested from the IOSUD during the evaluation visit and received, which is not found in the internal evaluation file received before the visit and referred to in the report. (See attached document)*
- *Screenshots/Print screens of the Doctoral School/IOSUD website proving specific claims in the report, accompanied by the date when they were accessed and saved. (See attached document)*

Prof. Qamrul Hasan Ansari