



# **The External Evaluation Report of the Chemistry Doctoral Study Domain**

## **UNIVERSITY POLITEHNICA OF BUCHAREST**

Preliminary report by  
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## I. Introduction<sup>1</sup>

The report shows the details and conclusions obtained by the International Expert during the online evaluation of the Chemistry domain in the PhD Doctoral Field. The online meetings took place during the week June 14-18 2021 with the following schedule:

<b>Date</b>	<b>hour (Bucharest time)</b>	<b>Activity</b>	<b>Participants</b>
June 10th	17:00 – 19:00	Meeting of panel members for discussing main methodological aspects related to the evaluation of doctoral studies	All evaluation panel members
June 14th	09:00-09:45	<i>Online preliminary meeting for the preparation and harmonization of evaluation steps, in hybrid mode, of doctoral study domains and IOSUD</i>	<i>IOSUD evaluation panel all evaluation panel members</i>
	10:00-10:45	<i>Online meeting with representatives of the institution and of the Council for Academic Doctoral Studies (CSUD)</i>	<i>domains evaluation panel all evaluation panel members  representatives of the University's management  representatives of the CSUD and of the Doctoral School /Schools  the contact person for IOSUD / doctoral domains</i>
June 15th	09:00-09:45	<i>Online preliminary meeting for the preparation and harmonization of evaluation steps, in hybrid mode, of doctoral study domains and IOSUD</i>	<i>IOSUD evaluation panel all evaluation panel members</i>
	10:00-10:45	<i>Online meeting with representatives of the institution and of the Council for Academic Doctoral Studies (CSUD)</i>	<i>IOSUD/domains evaluation panel all evaluation panel members  representatives of the University's management  representatives of the CSUD and of the Doctoral School /Schools</i>

<sup>1</sup> Each time when applicable the information shall be presented gender-wise.

			<i>the contact person for IOSUD / doctoral domains</i>
June 16th		<i>Continuation of the doctoral study domain and IOSUD evaluation activities</i>	<i>IOSUD evaluation panel at IOSUD level at doctoral study domain level</i>
	14:45–15:45	<i>Online meeting with the members of the Ethics Commission</i>	<i>IOSUD/domains evaluation panel all evaluation panel members Ethics Commission members</i>
June 17th		<i>Evaluation activities <u>Domain:</u> Online meeting with the Directors/ persons in charge of the research centers/laboratories within the doctoral study domain</i>	<i>Domain evaluation panel members of domain evaluation panel directors of research centers/laboratories</i>
		<i>Evaluation activities <u>Domain:</u> Online meeting with Doctoral Schools Council (CSD members)</i>	<i>Domain evaluation panel members of domain evaluation panel CSD's members</i>
		<i>Evaluation activities <u>Domain:</u> Online meeting with employers of Doctoral graduates in the domain</i>	<i>Domain evaluation panel members of domain evaluation panel employers' representatives</i>
June 18th	09:00-10:30	<i>Online technical meeting to identify specific issues that need to be clarified, if necessary, during the on-site visit</i>	<i>IOSUD evaluation panel all evaluation panel members</i>
		<i>Face-to-face working meetings, visiting the educational and research infrastructure</i>	<i>the coordinator of the domain evaluation panel university's representatives</i>
		<i>Completion of the evaluation documents</i>	<i>Domain evaluation panel at doctoral study domain level</i>
	11:45-12:45	<i>Online meeting for conclusions</i>	<i>IOSUD evaluation panel all evaluation panel members</i>
	13:00-14:00	<i>Meeting with representatives of the institution under review to discuss on the conclusions of the evaluation process and the main recommendations</i>	<i>IOSUD evaluation panel all evaluation panel members</i>

## II. Methods used

The methods used to perform this external evaluation were:

- The document “UPB Self Assessment Report” (the “SER”, from this point on), as well as their annexes
- The website of the University Politehnica of Bucharest (English version: <https://upb.ro/en/>), in particular the CSUD website (only in Romanian: <https://upb.ro/doctorat/>)
- No additional documents were used
- No physical visit was conducted by the international expert and, thus, no direct reference of the rest of the team’s visit is included in this evaluation report.
- Online meetings with different stakeholders (see agenda above):
  - representatives of the institution and of the Council for Academic Doctoral Studies (CSUD);
  - the contact person for the chemistry doctoral study domain and the team who drafted the SER;
  - the academic staff corresponding to the chemistry doctoral study domain;
  - PhD students of the doctoral domain;
  - the ethics commission;
  - graduates for the chemistry doctoral domain;
  - directors and persons in charge of the research centers/laboratories within the chemistry doctoral study domain;
  - the members of the doctoral school council (CSD); and
  - the employers of the chemistry doctoral domain graduates.

Despite the interest of ARACIS to conduct a regular evaluation process, no final meeting with specific conclusions on the different domains was conducted, and so this document is the first specific information the domain will receive regarding their evaluation.

## III. Analysis of ARACIS’s performance indicators

### ***Domain A. INSTITUTIONAL CAPACITY***

In this section, a set of criteria is analysed regarding the capacity of the institution to conduct appropriate level activities within the chemistry doctoral domain. The information is mainly extracted from the SER and complemented with some ideas provided by the several online meetings, in particular with the CSUD and the CSD. In particular, the section evaluates the fulfillment of the regulations extracted, essentially, from



- 1) the Law of National Education No 1/2011, with subsequent amendments and additions, in particular Title III - Higher Education, Chapter III - Organization of University Studies, Section 12 - Third Cycle - Doctoral Studies; and
- 2) the Code approved by Government Decision No. 681/2011, with subsequent amendments and additions.

The SER contains an overall description of the university (Section 1.1.1), as well as its Mission and objectives (Section 1.1.2), which in particular refer to “open opportunities”, research oriented QA systems, enhanced focus on research and a student and external orientation of the university as a whole.

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

This criterion determines the services capacities provided by the university to manage the chemistry doctoral domain activities. Section 1.1.2 in the SER specifically mentions the importance of leadership promotion in the management structure of the university.

*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.*

This standard determines the level of accomplishment of the practical implementation of the doctoral studies, in terms of mechanisms of admission, continued supervision, assessment and career promotion linked to the organization of doctoral studies.

**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.*

### **Evidences**



The UPB states that “The expenses developed by the University POLITEHNICA of Bucharest are made on the basis of the methodologies and procedures elaborated in accordance with the legislation in force, the activity being audited internally and externally.” (Section 1.1.4.3) The same section explains how the university provides scholarships to university students in general according to the students financial situation, and students are participating in such decisions, according to the legislation. The Regulations of the Doctoral Schools (revised editions) were adopted at the CSUD meetings on 29.01.2021 and 05.03.2021 (page 28 of the SER).

The doctoral schools from UPB are led by a Director of the doctoral school and by the Council of the doctoral school. The Director of the CSUD is elected in a competitive way (Section 1.1.5.1) and following this selection the CSUD is established, according to the legislation, as it was inferred from the meetings.

The procedures for admission, supervision and completion of the doctoral studies are organized and monitored by the CSUD Director and his/her board.

According to the SER (page 28-30), and referred to the specific items in this criteria:

(a) *The institutional regulation for the organization and advising activity of doctoral studies in IOSUD-UPB was first adopted by the UPB Senate Decision of 2011. Over time this regulation has been updated several times in accordance with the legal changes. The penultimate regulation (2018) was adopted by DECISION of the UPB Senate No. 391 of 13.12.2018. The last regulation (2020) was adopted by DECISION of the H.S.58 of 22.09.2020.pdf. This regulation is posted on the website<sup>2</sup>. The Regulations of the Doctoral Schools (revised editions) were adopted at the CSUD meetings on 29.01.2021 and 05.03.2021. The Regulation of the Doctoral School "Applied Chemistry and Materials Science" is posted on the website.<sup>3</sup>*

(b) *The nominal composition of the CSUD is set out in the Annex (UBP\_componenta\_CSUD\_2016-2020), corresponding to the 2016-2020 mandate. The DECISION of the UPB Senate, the CSUD was attended by all The Directors of the Doctoral Schools, the Director of the CSUD and a student representative. The nominal component of the CSUD for the 2020-2024 mandate is set out in Annex UBP\_componenta\_CSUD\_2020-2024*

(c) *The CSUD Director's Competition was held in 2012 for the 2012-2016 mandate, in 2016 for the 2016- 2020 mandate and in 2020 for the 2020-2024 mandate. Competition methodologies are presented in the exact Sciences Chemistry Annex A.1.1.1\_c1.pdf, The exact Sciences Chemistry Annex A.1.1.1\_c2.pdf and the Exact Sciences Chemistry Annex A.1.1.1\_c3.pdf*

d) *Each year, on a proposal from the CSUD, the UPB Senate approves the Methodology for admission to university doctoral studies at least 6 months before the date of the admission contest. In the Appendix the field of Exact Chemistry Sciences/ Annex A.1.1.1\_d.pdf is presented the Methodology of admission to doctoral studies for the academic year 2020-2021. We mention that this methodology has been revised (due to the pandemic, in view of the imposition of sanitary restrictions) in the sense of turning the entrance exam from "face to face" to "on-line".*

e) *At the IOSUD-UPB level there are two decisions of the UPB Rector which include the two procedures, namely the recognition of the status of Ph.D. Supervisor (Annexes to the field of Exact*

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<sup>2</sup>

<https://upb.ro/wp-content/uploads/2020/03/Regulament-organizare-si-desfasurare-studii-universitare-de-doctorat.pdf>

<sup>3</sup> <http://www.chimie.upb.ro/educatie/scoala-doctorala/documente>



Sciences Chemistry / Annex A.1.1.1\_e1.pdf) and the equivalence of the title of doctor obtained in other countries (Annexes to the field of Exact Sciences Chemistry/ Annex A.1.1.1\_e2.pdf).

f) CSUD meetings were held regularly, whenever it was necessary to debate and adopt important decisions. SD CASM is headed by CSD, elected at the meeting of 16 October 2020 (election documents), with the following composition: Director: Prof. Habil. Dr. Ing. Ileana Rau, members: Prof. Habil. Dr. Ing. Simina Daniela Stefan, Conf. Habil. Dr. Ing. Oana Cristina Pařvulescu, Prof. Habil. Dr. Ing. Stefan Ioan Voicu. Following the electronic consultation (Annex A.1.1.1.f\_1) CSD was completed with Acad. Maria Zaharescu and PhD students: Dr. Ing. Lupu Giovanina Iuliana and Dr. Ing. Stancescu Suzana Ioana. CSD CASM shall convene meetings in accordance with the SD CASM Regulation. The regularity of the convening of meetings is proven by the minutes in which decisions are recorded, in the exchange of emails between CSD members on a topic of interest to CASM SD. In view of the pandemic situation, the new board also has working meetings through the MS Teams platform (Annex A1.1.1.f\_2).

### **Analysis**

Following the analysis of the provided data in the SER, this evaluator finds a clear and well established legal basis for the operations and responsibilities of the CSUD. The regulations are clear and practice over the years shows no sign of doubts among the different stakeholders. The process of selection of the director and the CSUD members is clear and apparently follows the legislation. The roles of the director and the council were also made clear in the SER and from the online meetings.

The procedures starting in the admission and ending up in the completion of the doctoral studies are in place and follow the legislation.

### **Recommendations:**

No specific recommendations

### ***The indicator is fulfilled***

**Performance Indicator A.1.1.2.** *The doctoral school's 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.*

### **Evidences:**

The doctoral school's regulation follows the national legislation. Thus, according to the SER (pages 30-31), and referred to the specific items in this criteria:

(a) *the acceptance of new Ph.D. Supervisors, as well as regulations on how a Ph.D. Supervisor may be withdrawn as a member from the doctoral school;*

*The Regulation on habilitation and the granting of the status of PhD Supervisor in UPB, Chapter IV lays down the conditions by which new Ph.D. Supervisors are accepted in doctoral schools, on the basis of the opinion of the CSD, The way in which a Ph.D. Supervisor may be*



*withdrawn as a member of the doctoral school is governed by Art. 16, paragraph.d, Art. 52, para 4, respectively, Art. 57, paragraph 6 of the SD CASM Regulation.*

*(b) the mechanisms by which decisions are taken as to the appropriateness, structure and content of the training programme based on advanced university studies;*

*The aspects of point (b) are covered by the SD CASM Regulation, Chapter III.c University Doctoral Programmes*

*c) the procedures for changing the PhD advisor of a certain PhD student and the procedures for mediating conflicts;*

*The procedures for changing the PhD advisor of a certain PhD student are regulated by Art. 50, par. j, respectively Chapter. VI.b Change of doctoral supervisor.*

*Conflict mediation procedures are regulated by Art. 56.*

*d) the conditions under which the doctoral program may be interrupted;*

*The doctoral program may be interrupted based on Art. 22.*

*e) ways to prevent fraud in scientific research, including plagiarism*

*The prevention and sanctioning of fraud in scientific research, including plagiarism, is done according to Art. 40, paragraph 2c and Art. 44, para. 5a and 5b. – SD – CASM Regulation*

*f) ensuring access to research resources*

*Ensuring the access of the doctoral student to the research resources are regulated by Art. 55, par. 2d-f. – SD – CASM Regulation*

*g) attendance obligations of doctoral students*

*The attendance obligations of doctoral students are regulated by Art. 21, Art. 26, paragraphs 1 and 4, Art. 27, para. 1.*

## **Analysis**

The UPB provides in the SER a detailed analysis of the different sub items that appear in the Romanian legislation. Each of the items is fulfilled in accordance with the national legislation and the online meetings already showed the interest of the university to follow the legal framework without exceptions.

## **Recommendations**

No specific recommendations





***The indicator is fulfilled.***

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

During the site/online visit, several questions were put forward to assess the way the UPB put into practice its doctoral studies mission. Unfortunately, this evaluator was not physically present in the site visit, which preempts him to assess in person the details of fulfillment of this Standard. Most of the ideas are taken from the SER itself.

***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.***

**Evidences**

Annex A.1.2.1 describes the computer system used in the UPB to keep track of the student's academic progress.

**Analysis**

The Annex is in Romanian but it describes in a pretty detailed manner the way the student's supervision and assessment is managed by the doctoral school. The system appears to be relatively standard and straightforward, and no specific concerns about its use and structure were identified during the online site visit.

**Recommendations**

No specific 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.***

**Evidences**

According to the SER (page 31):  
*IOSUD provided access for The PhD Supervisors of SD CASM to the turnitin anti-plagiarism software by providing a username and password respectively. Details in Annex A.1.2.2.a Chemistry.*  
*In SD CASM chemistry, the average percentage of similarity for english thesis was ~22%, and for thesis written in Romanian, ~3% (see table in Annex A.1.2.2. Chemistry).*

**Analysis**



Turnitin is a de facto standard used by many European universities to check for plagiarism in academic documents.

## **Recommendations**

No specific 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.*

This particular standard was the objective of deep scrutiny by the evaluators and there was a particular concern about the lack of basal funding for the doctoral studies.

**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.*

## **Evidences**

According to the SER (page 32):

*The PhD Supervisors in the field of Chemistry won at least 9 grants in the period 2016-2020 as project manager or responsible from UPB, 3 of which are ongoing (see table in Annex A.1.3.1. Chemistry). At the same time, at the level of SD CASM from July 2019, the institutional project Work-based Learning Systems through entrepreneur scholarships for PhD students and postdoctoral fellows (SIMBA), Contract No. 51668/09.07.2019 SMIS Code 124705, Project co-financed from the European Social Fund through the Human Capital Operational Programme, Priority Axis 6- Education and Skills, period of deployment: 10.07.2019-09.01.2021.*

## **Analysis**

The PhD program is funded, essentially, from grants obtained by the supervisors. This is a good practice in general and a good engagement for the students. However, the level of financial support to students is relatively low and in general the studentships do not allow for the students to live independently during the PhD thesis. This fact, though, does not prevent the indicator to comply as it is written.

## **Recommendations**



No specific 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%.*

### **Evidences**

According to the SER (page 32):

*The number of 14 Ph.D. students, representing 30.4% of a total (average) of 46 PhD students, have benefited/benefit from an additional financial support of at least 6 months from research contracts or institutional project (see tables in Annex A.1.3.2.a Chemistry and Annex A132b Chemistry)*

### **Analysis**

The data indicates fulfillment, although the amount of funding devoted to student's allowance is clearly insufficient according to the different interviews. There is a need for reassessing the way students are financially supported while conducting their PhD studies. In particular, it would be of great interest that more and better contracts with industry would be in place to support living allowances of PhD students in charge of the research being carried out. As this is a critical indicator, and despite technical fulfilment of the criteria, the recommendation is clear in this direction if competitiveness of the university doctoral studies is desired.

### **Recommendations**

Despite fulfilment of the criteria, the recommendation is the revision of the living allowance for PhD students, which is particularly relevant, most likely, for a university if the capital of the country.

***The indicator is fulfilled.***

**Performance Indicator \*A.1.3.3.<sup>4</sup>** *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.).*

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<sup>4</sup> 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.



## Evidences

The Doctoral domain SER refers to the overall IOSUD criterion.

## Analysis

During the meetings a general message was received in the sense that this criterion was fulfilled, although no data is provided, according to the best of the understanding of this evaluator.

## Recommendations

No specific recommendations

***The indicator is fulfilled.***

## Criterion A.2. Research infrastructure

The assessment of this criterion was conducted through interviews with the responsible persons of the different research centers.

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

During the meetings, research centers directors were asked about some details concerning their infrastructure. During the site visit, this evaluator assumes there was an on site check of this fact, although he did not get any direct probe.

***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.*

## Evidences

The meetings included specific requests for evidence of the last part of the indicator (material purchased in the last 5 years). Beyond this fact, the evaluators analysed the web page for details of the specific platforms offered to the public, without success (at least in the English site).

According to the SER (page 33):

*The teachers and PhD students of the chemical field of SD CASM benefit from a well-developed research infrastructure, existing and available to them both in the few research centers/laboratories affiliated with the CASM Faculty (listed below), as well as in the laboratories of the PhD Supervisors of*



SD CASM (*Equipment of Research Laboratories (equipment, installations, computers) .pdf*). The list of several representative laboratories/centres in which many PhD Supervisors from SD CASM work, posted publicly on the ERRIS platform, is as follows:

1) Laboratory for innovative products and processes (<https://erris.gov.ro/LPPI---UPB>) 2) PESO (<https://erris.gov.ro/PESO---UPB>)

3) ULTRA-MINT Technologies (<https://erris.gov.ro/ULTRA-MINT---UPB>)

4) Mass Transfer in Green Process Engineering (<https://erris.gov.ro/MT---UPB>)

5) Advanced Organic Synthesis and Structural Analysis Laboratory OSSAL (<https://erris.gov.ro/OSSAL>)

6) Advanced Electrochemical and Corrosion Analysis Methods, AdECoMet (<https://erris.gov.ro/AdECoMet-UPB>)

7) Research Centre for Environmental Protection and Friendly Environmental Technologies (<https://erris.gov.ro/CPMTE---UPB>)

8) EcoNanoCoat (<https://erris.gov.ro/EcoNanoCoat-UPB>)

9) Laboratory of Functional Inorganic Materials (<https://erris.gov.ro/LabFIM-UPB>)

10) LBioIng (<https://erris.gov.ro/LBioIng---UPB>)

11) Advanced Polymer Materials Group (<https://erris.gov.ro/APMG---UPB>)

12) National Research Center for Micro and Nanomaterials (<https://erris.gov.ro/CNMN---UPB>)

PhD students also have access to literature in the UPB Central Library and libraries of all faculties, and through the ANELIS program (*Annex C.2.2.1.pdf*) to international databases such as Scopus or Web of Science or to the journals of Elsevier.

SD CASM through its members is constantly concerned with the material base by purchasing new and high-performing equipment. Of the recently purchased equipment we mention : Multi-functional system for extraction with supercritical fluids (2019 - 2,000,556 lei); Dielectric analysis system, impedance, EIS- AMETEK SOLARTRON ANALYTICAL (2019 - 600,000 lei); SPECTROMETRU FTIR INTERSPEC 200 X (including software) (2017 - 93808 lei); HPLC, thermal analysis equipment; Dinámica autoclave with accessories, (2019 - 31172 lei)

## **Analysis**

Most of the infrastructure for research is purchased using resources raised by the researchers themselves, with little or no basal funding by the university. The mission of the university, thus, strongly relies on the work made by researchers to obtain competitive funding. This is not bad in general, if the accessible funding is enough to conduct research, but it is important to analyse the percentages of research infrastructure a modern research oriented university should provide as basal investments.

Following this argument, no specific platform was identified to provide public access to the research infrastructure, which hinders, among other, the ability of the university to have the desired relevant role in the socioeconomic development of the region.

## **Recommendations**

To provide a soundful and annual investment to achieve the appropriate positioning as a research university that allows students to conduct research in state of the art infrastructure.



**The indicator is fulfilled.**

### **Criterion A.3. Quality of Human Resources**

This criterion was analyzed in dept during the interviews, although limited time was available and a limited number of persons attended the meetings.

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

Specific questions on the number of supervisors were put forward.

**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.*

#### **Evidences**

According to the SER (page 34):

*On 30 November 2020, 10 PhD Supervisors work in the field of PhD Chemistry, of which 5 (50%) meet the minimum CNATDCU standards at the time of the assessment for obtaining the certificate of habilitation (see table in Annex A.3.1.1. Chemistry).*

#### **Analysis**

Both indicator description and the evidence provided by the UPB are clear.

#### **Recommendations**

No specific 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.*

#### **Evidences**

According to the SER (page 34):

*On 30 November 2020, 10 PhD Supervisors worked in the field of PhD Chemistry and one (10%) of them had a permanent position in IOSUD (see table in Annex A.3.1.2. Chemistry).*

#### **Analysis**



Both indicator description and the evidence provided by the UPB are clear.

### **Recommendations**

Need to correct for the number of doctoral advisors with full-time employment contracts for an indefinite period with the IOSUD.

***The indicator is partially 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 proven 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.*

### **Evidences**

According to the SER (page 34):

*Holder of the compulsory discipline "Ethics", Prof. Dr. Ing. Raluca Stan (see Annex to Exact Sciences Chemistry/ CV\_ Raluca\_STAN.pdf), PhD Supervisor in SD CASM, Engineering Sciences/Chemical Engineering, is recommended for teaching the subject by the following elements: a) in 2012-2016 was a member of the 8-CNATDCU Commission, Chemical Engineering, Medical Engineering, Materials Science and Nanomaterials; b) is a short-term expert, panel member and trainer in the 4141 programme "Doctorate in Schools of Excellence - Evaluation of the quality of research in universities and increased visibility through scientific publication"- WP5 work package- increasing the capacity of scientific authority; c) is a short-term expert/trainer at the UPB Doctoral School (the mode of Ethics and Copyright) in doctoral and postdoctoral scholarship projects, funded by the European Social Fund (ESF), within the Human Resources Development Operational Programme-8 projects in the period 2011-2015.*

*Holder of the compulsory discipline "Research methodology and scientific authority", Prof. Dr. Ing. Alina Bađanoiu (see Annex to Exact Sciences Chemistry/ CV\_Alina\_BADANOIU.pdf), PhD Supervisor in SD CASM, Engineering Sciences/Chemical Engineering, is recommended for teaching the respective discipline from the experience in the field gained by teaching similar-themed courses to both MASTER's students from THE FCASM, as well as Ph.D. students and postdoctoral researchers involved in various POSDRU projects (see CV attached).*

*Holder of the discipline "Project Management " Mr. Prof. Dr. Ing. Constantin Opran is recommended for teaching this discipline of experience acquired both from teaching and courses and through papers and books written the field(see CV Opran)*



## Analysis

The analysis of the provided tables suggests the indicator is fulfilled.

## Recommendations

No specific 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<sup>5</sup> does not exceed 20%.*

## Evidences

According to the SER (page 35) and Annex A.3.1.4 Chemistry, from 10 PhD Supervisors affiliated with the chemistry field of SD CASM, 1 CD has between 8 and 12 PhD students (10%), (see table in Annex A.3.1.4. Chemistry).

## Analysis

The data is clear. However, the tendency for a modern university with interest in the learning process of the students, would recommend decreasing this percentage to zero.

## Recommendations

Although fulfilled, in the benefit of the student's learning processes, the recommendation of this evaluator is to eliminate the possibility to supervise concurrently more than 8 PhD thesis.

***The indicator is fulfilled.***

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

The team was concerned about understanding the research activities of the PhD supervisors through careful interviews,

**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*

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<sup>5</sup> 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.





*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 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.*

### **Evidences**

According to the SER (page 36), all PhD Supervisors affiliated with Chemistry, i.e., 10 (100%), have at least 5 Indexed Web of Science (ISI) publications with an impact factor, and 6 (60%) of these have other elements of international visibility over the last 5 years (see table in Annex A.3.2.1. Chemistry).

### **Analysis**

The data is clear, and the scientific productivity of the supervisors is outstanding in general terms. However, the indicators rely too much on publications and not in technology transfer items (patents, licenses, spin off, etc). As a general rule, the university should insist on promoting these other activities in their faculty, once the legal requirements of publications are fulfilled by them.

### **Recommendations**

No specific 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 minimale 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.***

### **Evidences**

As seen in the SER (page 36), from 10 PhD Supervisors in the field of Chemistry, a number of 5 (50%) met at least 25% of the value of the minimum CNATDCU criteria in 2016-2020 (see table in Annex A.3.2.2. Chemistry).



### **Analysis**

The data is clear.

### **Recommendations**

No specific recommendations

***The indicator is fulfilled.***

## ***Domain B. EDUCATIONAL EFFECTIVENESS***

In this domain, this evaluator was particularly concerned to keran about the relationship with the industry while and after the PhD, and the different posted questions tried to assess this information.

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

The criterion was analyzed in terms of specific data provided by the university.

*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.*

Special care was taken to assess the attraction capability of the university to foreign students.

***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.*

### **Evidences**

The report for the Chemistry domain in SD CASM is 0.61 (table in Annex B.1.1.1. Chemistry).

### **Analysis**

The data is self explanatory.

### **Recommendations**



No specific recommendations

***The indicator is fulfilled.***

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

Apart from data provided, interviews were made to assess from the students the degree of completion of this Standard.

***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.

### **Evidences**

The interviews demonstrated the interest of the PhD program to attract students with a high academic level.

### **Analysis**

Unfortunately, little was learnt about the ability of the university to assess the interest of students in conducting applied research devoted to improving the socioeconomic standards of the region.

### **Recommendations**

Although the indicator is fulfilled, it is important to make steps into establishing fruitful and stable relationships with the socioeconomic environment, which most likely implies modifying the admission processes to ensure the personal interests of the students match the university vision and objectives in the economic promotion of the region.

***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<sup>6</sup> does not exceed 30%.

### **Evidences**

The drop-out / abandonment rate of PhD students in the field of chemistry two years after admission in the period 2016-2020 is 3.64% (as seen in the table in Annex B.1.2.1 Chemistry).

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<sup>6</sup> 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.



## Analysis

The data is clear and acceptable. Unfortunately, there is no clear evidence of the existence of a protocol to prevent drop-out.

## Recommendations

No specific recommendations

***The indicator is fulfilled.***

## Criterion B.2. The content of doctoral programs

Emphasis was put into understanding the way the doctoral courses were conducted, as well as the connection between them and the individual PhD project.

*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.*

In this section, importance was given to the objectives of the PhD program in general, trying to assess to what extent the students were not just mere team workers to improve their supervisors CVs and, on the contrary, they were trained to be researchers during their PhD.

***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.***

## Evidences

The students are in particular concerned about the fact that the subjects are open to different PhD programs and they see this as a problem instead of an opportunity.

According to the SER (page 37);

*The training programme based on advanced university studies in IOSUD-UPB comprises 5 compulsory disciplines, of which 2 are specialized disciplines, established by the Doctoral Supervisors, and 3 are disciplines that provide cross-cutting competencies, which were approved by The Rector's Decision No. 41/30.10.2018, on the proposal of the CSUD. In Annex B.2.1.1\_a.pdf this decision is presented, and in the Annex B.2.1.1\_b.pdf. State of functions, at CSUD level, attesting to the programming of disciplines.*

## Analysis



Although the indicator is clearly fulfilled, this evaluator found a lack of interdisciplinarity within the courses, that was indeed a reflection of the same problems among the supervisors, with important exceptions. This may be corrected through a careful design of the training modules within the PhD program.

### **Recommendations**

No specific 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.*

### **Evidences**

The ethics discipline is provided for the training programme based on advanced university studies as a compulsory subject for all PhD students in the first year. The discipline syllabus is provided in Annex B.2.1.2.

### **Analysis**

Ethics is taken into account, although it is not clear that research integrity was included as well.

### **Recommendations**

Although fulfilled, it is recommended to explore the possibilities of evolution of the ethics course towards a more modern syllabus(RRI, research integrity, etc).

***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<sup>7</sup>.*

### **Evidences**

According to the SER (page 38):

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<sup>7</sup> 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.



*Discipline sheets for the compulsory subjects in the plan corresponding to the training program based on advanced university studies, namely: Project Management and Research Methodology and Scientific Authority, are presented in Annex B.2.1.3.pdf.*

### **Analysis**

Although the teaching and learning aspects of the PhD programme are taken formally into account, the programme itself appears more oriented towards results (articles) than towards questions, methods and analysis, and even less towards outcomes, which are key for the formation of new researchers.

### **Recommendations**

No specific 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.*

### **Evidences**

According to the SER (page 38):

*PhD students in the field of Chemistry in SD CASM receive the support of the mentoring committee throughout their doctoral internship. This is demonstrated by the table in Annex B.2.1.4. Chemistry. The criterion is fulfilled because that table indicates that 47% of PhD students who supported the thesis in 2016-2020, i.e., had a scientific contribution (article, patent, poster or presentation at conferences) together with at least one member of the mentoring committee.*

### **Analysis**

The data shows a good work of the mentors in supervising the work by PhD students, mostly related to their own research interests and projects.

### **Recommendations**

No specific 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.*



## Evidences

According to the SEr (Page 38) and Annex B.2.1.5.Chemistry, the ratio between the number of PhD students (46) and the number of teachers/researchers providing mentoring (26) is 1.64, which gives a good value with respect to the limit fixed by this indicator.

## Analysis

The data is clear.

## Recommendations

No specific recommendations

***The indicator is fulfilled.***

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

Emphasis was put in assessing the impact of the thesis in the socioeconomic environment, apart from the publications indicators.

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

Great emphasis here in understanding if there is a stable support to students to transfer their knowledge.

***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.

## Evidences

In annex B.3.1.1. Chimie, a list of 39 articles by PhD students is given. We have selected 5 of them for our analysis:

1. (39) I. Iancu, G.L. Radu, Occurance of neonicotinoids in waste water from the Bucharest treatmentplant, Anal. Methods, 10, 2018, 2691-2700;
2. R-I Stefan-van Staden, AG Diaconeasa, C Stanciu-Gavan, Fast Screening of Tissu Samples for Glycogen, Journal of Pharmaceutical and Biomedical Analysis, 135,16-19, 2017;
3. I Ion, R.M. Senin, B. Vasile, A.C. Ion, Influence of the matrix of aqueous solutions on

the adsorption of endocrine disruptors by fullerene C60, J. Environ. Eng. & Landscape Manag., 2019, 27(1), 1-11.

4. Electrochemical stability of Titanium-Hydroxyapatite implantable material modified with Ceftriaxone, L. Ichim, C. Pirvu, C.C. Manole, International Journal of Electrochemical Science, 13(12) 2018, 11895-11905.
5. Mădălina Mihalache, Ovidiu Oprea, Guran Cornelia, Alina Holban, Synthesis, characterization and biological activity of some complex combinations of nickel with  $\alpha$ -ketoglutaric acid and 1-(o-tolyl)biguanide, Comptes Rendus Chimie, 2018, vol. 21(1), 32-40(FI=1,877).

## Analysis

In order to assess the indicator “At least 3 selected papers must contain significant original contributions in the respective domain” we have analyzed the IF, quartile and citations obtained by the different article, taking into account the recent publication of all of them and, in particular, the role of the student in each article. Here is the analysis:

Article (number in annex)	PhD student's role	Quartile	# of citations
1 (39)	first and corresponding author	Q1 and Q2, depending on the area	10 (Scholar)
2 (27)	second author	Q1 in Pharmaceutical Science	2 (journal page)
3 (13)	second author	Q1 and Q2, depending on the area	0 (researchgate)
4 (7)	first author	Q3	1 (Scholar)
5 (23)	first and corresponding author	Q2	2 (journal page)

1. 3 of the articles are published in Q1 journals.
2. 4 of 5 are already cited, despite the short period from their publication
3. In 3 of the articles the phd student is the first author. In 2 of them is also the corresponding author

Overall the results are very satisfactory, taking into account they are articles in analytical chemistry journals, which typically achieve less overall impact.

## Recommendations

No specific 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.*

#### **Evidences**

Within the period 2016-2020, 39 thesis were defended that resulted in 51 participations with communication of PhD students (Annex B.3.1.2.Chemistry) at conferences and international symposiums (ratio = 1.3).

#### **Analysis**

The data is clear.

#### **Recommendations**

No specific 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.*

The item was analyzed by data gathering from the documentation and through the on site interviews.

**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.*

#### **Evidences**

According to the SER (page 39):

Table in [AnnexB.3.2.1.Chemistry.pdf](#) presents the reviewers who evaluated the doctoral thesis held in SD CASM – chemistry field in the period 2016-2020. From the information presented here it follows that this criterion is not fulfilled because during the period mentioned there were external references who evaluated in a year more than two doctoral thesis developed under the guidance of the same Ph.D. Supervisor, as follows:

- PhD Supervisor Raluca van Staden
- reviewer Lucia MUTIHAC – 4 theses evaluated in 2018



## **Analysis**

Given the number of total PhD studies, his unfulfillment is purely anecdotic, but needs to be addressed in order to ensure transparency and to help the university to establish new collaborations. It is also worth mentioning that new standard has been put forward very recently, without giving time to the university to adapt.

## **Recommendations**

To establish a protocol to prevent the repetition of panel members in the thesis of the same supervisor.

***The indicator partially 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.*

## **Evidences**

According to Annex B.3.2.2.Chemistry, no reviewer who has reached or exceeded the required limit (30% of the 39 theses supported, i.e. 12 theses) of theses evaluated. The highest number of theses evaluations in the field of Chemistry in the period 2016-2020 belongs to the reviewer Lucia MUTIHAC, who was the reviewer of 10 theses.

## **Analysis**

The data is clear.

## **Recommendations**

No specific recommendations

***The indicator is fulfilled.***

## ***Domain C. QUALITY MANAGEMENT***

The evaluation tried to assess, in addition to the QA processes, which were shown to be fulfilled in general, but the QE tasks, in order to ensure the accreditation processes are also positive for the evolutions of the institution.



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

General and standard assessment of the QA procedures.

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

Assessing if the ESG is in place.

**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.*

### **Evidences**

According to the SER (page 40):

*Within the SD CASM was updated by decision 2/19-01-2021, the quality assurance committee. This committee is made up of Mr. Prof. Dr. Ing. Stefan Voicu as President of the Commission and Mrs. Conf. Dr. Ing. Oana Pãrvolescu as a member. This committee also participated in the cross-audit process.*

*Both the work within the CASM SD and the cross-audit process will be carried out in accordance with the "Operational procedure for the evaluation and internal monitoring of the evolution of doctoral schools PO- SC-10-27".*

*The purpose of this procedure is to establish the general framework, the content and organisation of the internal monitoring and evaluation process of the evolution of doctoral schools, the determination of the competences and responsibilities of the persons and decision-making bodies participating in this process.*

### **Analysis**

There are proper QA and audit mechanisms in place to assess the quality of the doctoral domain and at the level of IOSUD.

### **Recommendations**



No specific 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 them 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.*

### **Evidences**

Feedback by the students is ensured by the [“Operational procedure for evaluation and internal monitoring of the evolution of doctoral schools PO-SC-10-27”](#).

### **Analysis**

During the interviews, no clear idea of the relevance of the opinion of the students was assessed. Although mechanisms seem to be in place, it is not clear that the messages are taken into account and actions are taken by the institution in general.

### **Recommendations**

Although the indicator is fulfilled, there is a strong recommendation by this evaluator to develop and implement iterative feedback resources to both students and supervisors. It is also important to ensure the student is heard by some professor different from her PhD supervisor, as a mentor.

***The indicator is fulfilled.***

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

In this Criterion, importance was given to the public information through the web site.

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

Web analysis.

**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.

### **Evidences**

According to the SER (page 41):

The information related to SD CASM is published on its website: <http://www.chimie.upb.ro/educatie/scoala-doctorala>. On this page, (a) the doctoral school's rules are published; (d) the content of the study programmes; (e) the scientific profile and research interests/themes of the Ph.D. Supervisors in the school, as well as their institutional contact details; (f) the list of Ph.D. students in the school with basic information (year of registration; Ph.D. Supervisor);

On the website of IOSUD-UPB (<https://upb.ro/doctorat/>) are published (b) the admission regulation; (c) the study completion regulation including the procedure for public support of the thesis; (g) information on the standards for the development of the doctoral thesis; (h) links to the summaries of the doctoral thesis to be publicly supported, as well as the date, time, place where they will be supported, at least 20 days before the support.

### **Analysis**

The information is made public in an open manner. However, much information is still not translated into English, which prevents the admission of foreign students.

### **Recommendations**

ensure all relevant information is in English as well as Romanian.

### **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 analysis of the information provided by the IOSUD.

**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.



## **Evidences**

According to the SER (page 41):

*PhD students in SD CASM have free access, through the ANELIS PLUS 2020 program, to a platform with academic databases relevant to the fields of Chemistry and Chemical Engineering, respectively, based on the computer IP through which the link is made, which must belong to UPB. Among other things, PhD students have access to SCOPUS and WEB OF SCIENCE databases and also to the journals of Elsevier publishing house, which has numerous publications in the field of chemistry and chemical engineering. In AnnexC.2.2.1.pdf*

## **Analysis**

The access to journals is not complete, but probably sufficient.

## **Recommendations**

No specific 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.

## **Evidences**

According to the SER (page 41):

*OSUD provided access for The PhD Supervisors of SD CASM to the Turnitin anti-plagiarism software by providing username/password respectively. Details in AnnexA.1.2.2.Chemistry. PhD students of each Ph.D. Supervisor shall have access, upon request, through the Ph.D. Supervisor, to this programme.*

## **Analysis**

Turnitin again as a standard tool for similarity/plagiarism search is a standard tool successfully used in many different institutions.

## **Recommendations**

No specific 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.*

#### **Evidences**

According to the SER (page 41), all PhD students in SD CASM have access to scientific research laboratories or computing laboratories within SD and the CASM Faculty, after a work schedule established with the Ph.D. Supervisor. Experimental research, computational applications, is supervised by the Ph.D. Supervisor.

#### **Analysis**

Standard approaches run in the UPB concerning students' access to resources.

#### **Recommendations**

No specific recommendations

***The indicator is fulfilled.***

### **Criterion C.3. Internationalization**

The degree of internationalization was a constant during the site visit, appearing in all interviews.

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

The team aimed at assessing the importance the university gives to international mobility of the PhD students.

**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.*

#### **Evidences**

According to the SER:



33.3% (13 Ph.D. students) of PhD students who completed their doctoral thesis in the range of 2016-2020 (39 Ph.D. students) participated in conferences and symposiums held abroad (see table in Annex C.3.1.1. Chemistry).

### **Analysis**

The mobility is clearly insufficient, according to the data provided by the university. Only few mobilities in conferences. The institution should look for mechanisms to send their students abroad for medium periods of time.

However, based on the data provided, the recent change in criteria by ARACIS in the percentages, and also the limitations imposed by the pandemics on mobility this last year, we believe the indicator as it is proposed is fulfilled.

### **Recommendations**

To create a specific fund to support longer stays in foreign groups for the best students.

***The indicator is 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.

### **Evidences**

Only marginal invitations of foreign researchers to provide conferences are considered.

### **Analysis**

The indicator is clearly insufficient, and cotueles of PhD thesis are not in place. From the interviews this did not seem to concern the supervisors, though. It is obvious that putting in place a mechanism to enhance this mobility implies the investment of resources, but the university is encouraged to find ways to achieve this indicator.

### **Recommendations**

To develop a specific program of PhD cotutelle. They have, however, and invited researcher. It is important to improve this figure.

***The indicator is partially 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.).

**Evidences**

According to the SER (page 42):

*IOSUD-UPB participated in numerous educational fairs in 2016-2018 to attract international Ph.D. students. These participations are set out in Annex C.3.1.3.pdf for the years 2017 and 2018.*

**Analysis**

Despite what the SER shows, it seems the IOSUD is far from achieving the goals of attracting international students. A better programme should be in place to ensure this outcome.

**Recommendations**

To develop a specific international program that can be recognized by a foreign student that would like to graduate from UPB, taking advantage of the excellent scientific achievements of its members.

***The indicator is partially fulfilled***

**IV. SWOT Analysis**

<p><b><u>Strengths:</u></b></p> <ul style="list-style-type: none"> <li>-the PhD program is well consolidated in general</li> <li>-the thesis supervisors are scientifically competent</li> <li>-the level of the PhD students is strong and they exit the program with a solid formation</li> </ul>	<p><b><u>Weaknesses:</u></b></p> <ul style="list-style-type: none"> <li>-there is close to zero interaction (on average) with the industry as a stakeholder</li> <li>-there is a lack of international strategy</li> </ul>
<p><b><u>Opportunities:</u></b></p> <ul style="list-style-type: none"> <li>-The fact that Romania is a member of the EC, it can attract a wide range of students from third countries that can use the UOB as a way to start a career in Europe. The relatively cheap living rates make Romania an attractive place for PhD students.</li> <li>-The economic potential of Romania is not used to establish strong relationships with the industry from the university.</li> </ul>	<p><b><u>Threats:</u></b></p> <ul style="list-style-type: none"> <li>-the lack of international projection prevents the students from exploring other countries looking for research opportunities, and may create frustration after the completion of a Phd if not additional opportunities are generated within the country.</li> <li>-the industrial sector may see the university as a residual research system and this can narrow the door for PhD graduates to enter the private sector</li> </ul>

## V. Overview of judgments awarded and of the recommendations

No.	Type of indicator (*, C)	Performance indicator	Judgment	Recommendations
A.1.1.1		fulfilled		
A.1.1.2		fulfilled		
A.1.2.1		fulfilled		
A.1.2.2		fulfilled		
A.1.3.1		fulfilled		
A.1.3.2		fulfilled		
A.1.3.3	*	fulfilled		
A.2.1.1	C	fulfilled		increase investments budget for research infrastructures
A.3.1.1	C	fulfilled		
A.3.1.2	*	partially fulfilled		incorporate more full-contract professors (tenure track calls)
A.3.1.3		fulfilled		
A.3.1.4	*	fulfilled		
A.3.2.1	C	fulfilled		
A.3.2.2	*	fulfilled		
B.1.1.1	*	fulfilled		
B.1.2.1	*	fulfilled		
B.1.2.2		fulfilled		
B.2.1.1		fulfilled		
B.2.1.2		fulfilled		
B.2.1.3		fulfilled		
B.2.1.4		fulfilled		
B.2.1.5	C	fulfilled		
B.3.1.1	C	fulfilled		
B.3.1.2	*	fulfilled		
B.3.2.1	*	partially fulfilled		establish protocol to prevent repetition in panel members
B.3.2.2	*	fulfilled		
C.1.1.1		fulfilled		
C.1.1.2		fulfilled		
C.2.1.1	C	fulfilled		
C.2.2.1		fulfilled		
C.2.2.2		fulfilled		

C.2.2.3		fulfilled		
C.3.1.1	*	fulfilled		to create a fund to support longer international stays for PhD students
C.3.1.2		partially fulfilled		to develop a program for PhD cotutelle
C.3.1.3		partially fulfilled		improve attraction program for foreign students

## VI. Conclusions and general recommendations

The UPB is a mature and well established research institution that runs several PhD programmes with high quality researchers as supervisors and strong involvement and performance of its students. some issues of concern in this evaluation refer to:

- 1) The relatively low level of investments of the university in research infrastructure, according to the average contribution of the research groups to purchase and maintain equipment from research grants. A balance between basal research investments and individual lab investments should be achieved. This affects Critical indicator A 2.1.1. However, from the site visit it was clear that funding and initiative coming from the researchers is very good and it deserves recognition.
- 2) Low income of PhD students during their PhD thesis, which implies the need to create better and well funded scholarships. An approach to the industry may be beneficial both for this increase of funding for PhD students but also for the final professional career and the evolution of the socio economic environment.
- 3) In general low or very low indicators of professors in the PhD program. These include the need for more positions at the R3 level, with faculty members that can deliver good teaching at the same time as having a central role in research.
- 4) Better quality control of PhD thesis supervision, mentoring, assessment, to ensure the indicators that the legislation imposes are fulfilled. This is not just for compliance but more importantly for the increase of the national and international prestige of the institution.
- 5) a strong need to improve the internationalization of the institution, incrementing both in and out mobility for research secondments (not just conferences). Such strong action is compulsory if the network of research is to be improved. The position of Romania as a relatively new member of the EC, along with the high level of its basic and applied research, makes the country highly attractive to Horizon Europe programs, among other sources of funding. This is a strategy that Romanian institutions should promote at all levels, from student's mobility to openness of the universities to hire foreign professors and also enhance internal mobility between Romanian institutions.