

# **The External Evaluation Report of an Institution Organizing Doctoral Study Programs (IOSUD)**

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## **I. Introduction<sup>1</sup>**

I was invited with colleagues, as a member of ARACIS The Romanian Agency for Quality Assurance in Higher Education (ARACIS) to participate in the evaluation of the Doctoral study of the Politehnica University of Bucharest. UPB currently has over 30.000 students in one of three study cycles. The education system is specific because it is 4+2+3. The teaching activity is provided by a team formed in the current academic year of 1382 teachers with an indifferent contract, of which 331 teachers, 284 lecturers, 513 heads of papers/readers and 254 assistants. 575 associate teachers: Ph.D. students, industry or research specialists, retired UPB professors. University POLITEHNICA of Bucharest is an integral part of the international academic community. UPB is part of CESAER, EUA, EUA-CDE, AUF and BSUN academic organization European, Agency of France and Black Sea University Network.

Promoting academic freedom, honesty and integrity, equal opportunities in access to university-level curricula, independence in thought and innovative spirit, openness as part of the international scientific community. UPB establishing a system quality assessment and assurance in all areas of academic life, to achieve academic excellence in teaching/learning and scientific research and develop a culture of quality. Promoting flexible academic programs, development of student's intellectual skills and professional knowledge, according to their talent and aspirations, as well as the training them of professional and cross-cutting skills appropriate to the future job. Development of system of efficient management, participatory management in all activities.

Doctoral studies programs were carried out following the provisions of the Code of University Studies for Doctorate (HG no.6845/2011) and the Regulation on the organization and conduct of doctoral studies, approved by the UPB Senate in the years 2011, 2018 and 2020.

Council for Doctoral Study (CSUD) increasing scientific performance in all doctoral programs, developing interdisciplinary collaborations, development of research infrastructure in doctoral schools as a prerequisite for the achievement of internationality competitive doctoral thesis, promoting UPB doctoral studies, elaboration of normative acts, representation of IOSUD-UPB

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<sup>1</sup> Each time when applicable the information shall be presented genderwise



in EU projects, conference and post- doc researchers.

- During a period from 14.6.2021 to 25.6.2021, we have an evaluation period. During this period we have many online meetings with all subjects in Doctoral study at the Politehnica University of Bucharest. We had activities every day with different groups of subjects from a University involved in the evaluation.
- 15.6.2021 had full day activities:
- From 9:00-9:45 had an online preliminary meeting for the preparation and harmonization of evaluation steps, in hybrid mode, of doctoral study domains and IOSUD the context in which this external evaluation report was drafted with all evaluation panel members.
- From 10:00-10:45 had an online meeting with representatives of the institution and of the Council for Academic Doctoral Studies (CSUD) with *all evaluation panel members and representatives of the University's management and the contact person for IOSUD / doctoral domains*
- From 11:30-12:30 had *Online meeting with the director of CSUD / directors of doctoral schools and the team who drafted the internal evaluation report with representatives of CSUD and of doctoral school(s)/IOSUD with IOSUD evaluation panel, Members of IOSUD evaluation panel and representatives of CSUD and of doctoral school(s)/IOSUD*
- From 15:00 – 16:00 had *Online meeting with IOSUD academic staff, IOSUD evaluation panel, Members of IOSUD evaluation panel and Doctoral coordinators*
- 16.6.2021 continue another day activities:
- From 9:00-11:00 had a *continuation of the doctoral study domain and IOSUD evaluation activities with IOSUD evaluation panel, at IOSUD level and at the doctoral study domain level.*
- From 11:00-12:00 had *Online meeting with Ph.D. students with IOSUD evaluation panel at IOSUD level and doctoral study domain level*
- From 12:00-13:00 had *Continuation of the doctoral study domain and IOSUD evaluation activities with IOSUD/domains evaluation panel together with all evaluation panel members and Ethics Commission members*
- 17.6.2021 continue another day activities:
- From 09:00-10:30 had *Online meeting with the Commission for Quality Evaluation and Assurance (CEAC) members / Quality Assurance Department with all evaluation panel members and representatives of Commission for Quality Evaluation and Assurance (CEAC) / Quality Assurance Department*
- From 12:00 – 13:00 had *Online meeting with the Directors/ persons in charge of the research canters/laboratories within IOSUD with IOSUD evaluation panel, members of IOSUD evaluation panel, Directors of the research centres/laboratories*
- From 15:00 – 16:00 had *Online meeting with Doctoral University Studies Council (CSUD) members with IOSUD evaluation panel and CSUD's members*
- From 17:30-18:30 had *Online meeting with employers of doctoral graduates, IOSUD evaluation panel, members of IOSUD evaluation panel and employers' representatives*
- 18.6.2021 continue another day activities:
- From 09:00-10:30 had an *Online technical meeting to identify specific*



*issues that need to be clarified, if necessary, during the on-site visit with all evaluation panel members.*

- *From 11:00-13:00 had Continuation of the doctoral study domain and IOSUD evaluation activities with IOSUD evaluation panel at the doctoral study domain level*

The evaluation is based on written documentation, information obtained through one video meeting with the dean of research and administration, and a site visit. The written material comprised the internal evaluation report, examples of theses from each track, evaluation reports for theses, and a comprehensive set of data on several candidates, enrolment frequency, dissertations, course participation etc. Also, a self-description from each track was prepared.

**The general objectives** of the doctoral fields aim at:

- the acquisition of in-depth knowledge in the areas of fundamental disciplines, as well as basic knowledge regarding the approach, planning and completion of research activities.
- development of transversal competencies related to complex documentation, substantiation, research planning, as well as the elaboration of research reports.
- the usage of specific research equipment, as well as the acquisition of skills on data collection and acquisition techniques, their processing and interpretation of results.
- the use of software tools and systems specific to the research activity.
- **The specific research objectives** of the doctoral programs are associated with the training of specialists with high research capacity in the areas.
- The doctoral study programs train highly qualified researchers for education, science, and economic activities in the doctoral fields.
- The doctoral research opens perspectives of knowledge and innovation for new technologies.
- Increasing the collaboration with the scientific research centres from UPB, with the PRECIS Advanced Research Centre of the Faculty of Automation and Computers (A&C) from UPB, including in partnership with other research institutes, universities, as an essential factor in increasing production scientific.
- Successful participation of teams of scientific coordinators - Ph.D. students in competitions for funding scientific projects from national or European funds (H2010) in partnership with leading universities in the country and abroad.
- Participation in major research projects underway at the national level or prestigious bodies in the field.

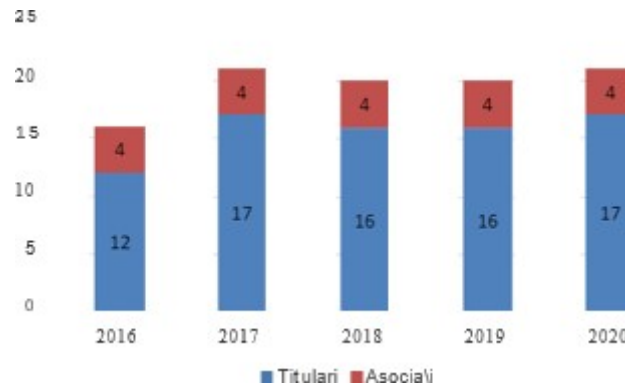
Within the CTI doctoral field, there are thematic approaches such as:

- Modern computer architectures, Cloud and fog computing architectures, Security of computer systems and computer networks, Data mining, Computational linguistics and natural language processing, Systems based on Virtual and Augmented Reality, Development of IoT solutions



and Cyber-physical systems, Systems based on machine learning, Development of service science and integration of solutions, Intelligent robotics, e-Learning systems and Computer systems in medicine.

The number of doctoral supervisors in the fields of Systems and Computer Engineering and Information Technology organized by SD\_AC in the period 2014-2018 is presented respectively in the Annexes A\_1c2\_IS and A\_1c2\_CTI.



### Number of PhD supervisors in the field of Computer Science and Information Technology

The evolution of the number of doctoral students and of the number of doctors in the last 5 years:

- The evolution of the number of doctoral students admitted to SD AC in the last 5 years is presented in the following tables:

#### Evolution of the number of doctoral students admitted in the field of CTI (SD A&C + SDIALA)

Nr. Doctoranzi admi	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Buget cu bursa	13	10	19	17	19
Buget fara bursa	13	18	17	17	19
TOTAL Buget	26	28	36	34	38
TOTAL Taxa	6	3	3	2	3
<b>TOTAL</b>					

Evolution of the number of doctoral students admitted in SD AC

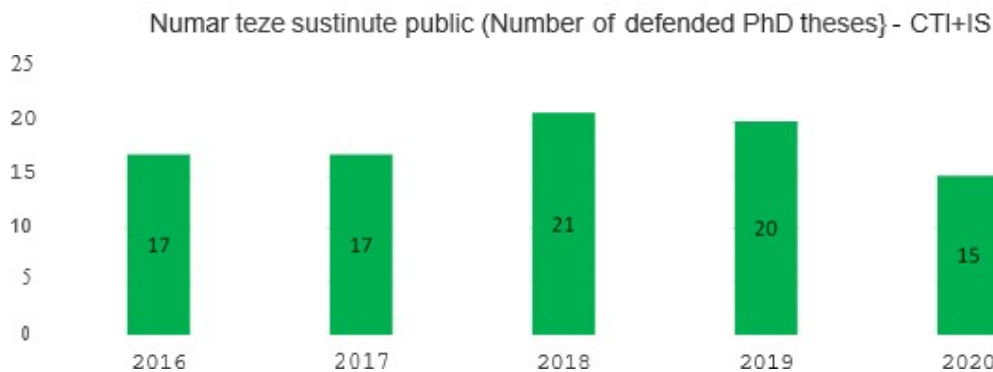
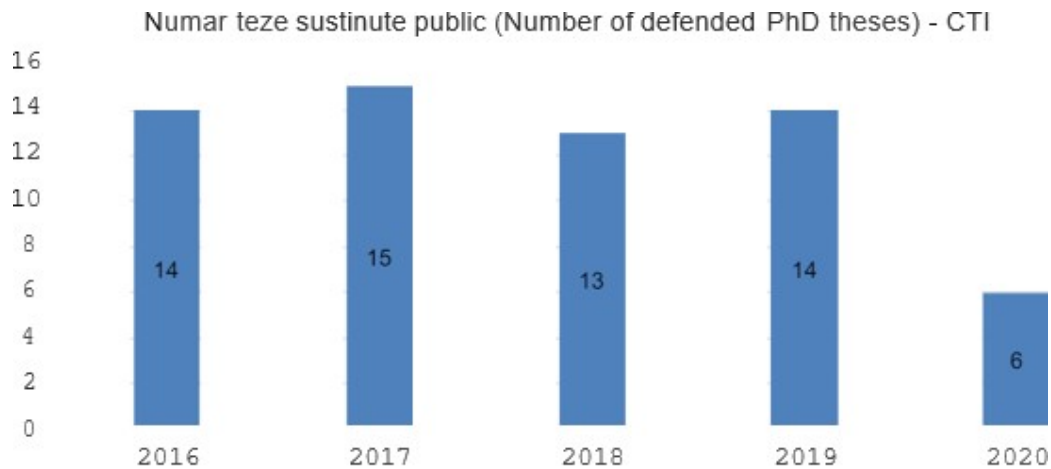
Nr. Doctoranzi admi	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Buget cu bursa	19	18	29	28	32
Buget fara bursa	25	26	24	25	34
TOTAL Buget	44	44	53	53	66

- The lists of doctoral students admitted to SD AC during 2016 - 2020 are presented in Annexes A\_1c4\_IS,CTI - A\_1c8\_IS,CTI.
- The evolution of the total number of PhD students in internships in the field of CTI are included in Anexa A\_1d1\_CTI.

The evolution of the number of doctoral theses defended publicly by doctoral students from SD\_AC in the doctoral field IS in the period 2014 - 2018



is presented in Annex **A\_1c9\_SD\_AC (sheet 1 - CTI, sheet 2 - IS)**. The statistics are as follows.



- The University has a **Procedure for initiating, monitoring and periodically evaluating the study programs**, which establishes the stages and documents necessary to promote a new study program.
- In approaching the establishment, restructuring and re-evaluation of undergraduate, master's and doctoral study programs, the Polytechnic University of Bucharest is in constant contact with the evolutions of the education systems, with the labour market evolutions and with the requirements imposed by the qualifications offered.
- The evaluation of the professors by the students is done based on some questionnaires, using the specific section on Moodle.
- Following the provisions of the National Education Law no. 1/2011 in the Polytechnic University of Bucharest, the self-evaluation and evaluation of the teachers are performed annually, using the procedure approved annually by the UPB Senate:
- Each teacher must complete the self-assessment form, with the concrete specification of the activities carried out for a calendar year. If measures are imposed, they are established at the level of the Department Council.
- At the level of the faculties, an analysis is made regarding the evaluation of the teachers.



- **At the level of Doctoral Schools, an analysis is performed regarding the evaluation of doctoral coordinators.**
- The results of the evaluation are considered when filling the teaching positions by competition, when awarding merit grades, at differentiated salaries, when granting the extension of activity.
- University POLITEHNICA of Bucharest presents on its website, [www.upb.ro](http://www.upb.ro), information on the institutional state of quality, and the Quality Council and the Quality Commissions of the university faculties are informed about the quality of the educational process in European universities, especially in the EU, with which it compares itself.
- There is a centralized database and a structure created for the management of schooling at UPB level, as well as concerns for completing the database.
- The Quality Assessment and Assurance Commission (CEAC) is constituted according to the law and approved by the UPB Senate.
- The functionality of the quality assurance structures is regulated by the Procedure for implementing the quality improvement plan and the Procedure for analysing the effectiveness of the Quality Management System.
- Evaluation procedures and activities on the quality of education have been developed and approved by the University Senate.
- The evaluation and quality assurance commission elaborates the annual internal evaluation report which it presents for approval to the UPB Senate and formulates proposals for improving the quality of education included in a plan of measures (**Annex A\_1q\_IOSUD**).
- After approval in the university Senate, the documents are displayed on the UPB website.
- Through joint activities with foreign universities (doctorates in co-supervision, mobility within the Erasmus program, research contracts), established through bilateral agreements.
- UPB partnerships with graduate employers (industrial companies, banking institutions, town halls, etc.) and with candidate providers and other localities, generate information that is taken into account in planning, organizing and conducting teaching and research process.
- The director of the Doctoral School, together with CSD and CEMSD, constantly evaluates the individual doctoral study plans in the field of IS and CTI, and the doctoral supervisors constantly monitor, together with the guiding commission, the activity of each doctoral student they coordinate.

Participation of staff, students, and external stakeholders in the quality assurance process.

- The director of the Doctoral School, together with CSD and CEMSD, constantly evaluates the individual doctoral study plans in the field of IS and CTI, and the doctoral supervisors constantly monitor, together with





the guiding commission, the activity of each doctoral student they coordinate.

- carrying out research considered significant by a commission of expert evaluators, through the process of taking each paper/exam in the presence of the guidance committee as well as by publicly defending the doctoral thesis in the presence of a committee of references established in compliance with regulations.
- verifying the authenticity of the research report through the Turnitin similarity detection software; this procedure has a formative, preventive, and detection role at the same time.

Interaction between quality assurance system and university management

- Information about the scientific offer of the members of the Doctoral School of Automation and Computers. <http://doctorat.acs.pub.ro/conducatori-si-oferta-stiintifica/oferta-stiintifica/>
- Information about the doctoral <http://doctorat.acs.pub.ro/admitere-doctorat/>
- Information on mobility, including Erasmus for doctoral students: <http://doctorat.acs.pub.ro/manifestari-si-competitii/competitii-burse-doctorale/>, <http://acs.pub.ro/parteneriate/relatii-internationale/>
- Regulations for Doctoral School students: <http://doctorat.acs.pub.ro/componenta-si-organizare/regulamente-sd-ac/>
- IOSUD regulations regarding the organization and development of doctoral university studies in UPB, admission to doctorate, public defence of theses, empowerment of doctoral supervisors and equivalence conditions;
- The Regulation on the Quality Management System in IOSUD UPB, Regulation on the functioning of the Quality Council, as well as in the Organization Chart for the inclusion of the SMC structure in IOSUD UPB.

## II. Methods used

The logical framework, or log frame, is the most common and best-known planning tool used in international development. It is also the most hotly debated. Originally designed for use in simple time-bound projects, it is now the tool of choice for donors in interventions ranging from small projects to organizational core funding. The logical framework is often used as a basis for monitoring and evaluation. A logical framework can have many different purposes depending on the context, and it is probably this that has made it so popular. It was originally conceived as a planning tool, aimed at supporting the management of planned processes. However, depending on the circumstances, a log frame can be:

- a planning tools.



- a tool for program management.
- the basis for M&E in a project or program.
- an accountability mechanism.
- a succinct summary of a piece of work.
- a 'window' into the work of an organization or complex program.
- a linear theory of change; or
- a mechanism for seeking funding.

Narrative summary	Objectively Verifiable Indicators	Means of Verification	Assumptions
Goal:			
Objectives:			
Outputs:			
Activities:			
Inputs:			

Starting with the narrative summary column, the goal defines the longer-term impact that a project or program aims to contribute to. The goal may be designed to be achieved after completion of the project or program and may depend on the actions of many different agencies, as well as changes in the external environment. The next row down deals with the objectives or purpose of the project or program – the changes it hopes to directly influence over its lifetime. The outputs row includes the tangible products or services the project or program aims to produce. The last two rows deal with the activities of the project or program and the resources required (inputs).

The second column – objectively verifiable indicators – defines what information will be collected to indicate whether or how far the goal, objectives and outputs have been achieved. The third column – means of verification – indicates the sources that will be used to collect the indicators, such as interviews, observation, or secondary sources. The final column identifies the key risks and assumptions that might influence the success or otherwise of the project or program.

### III. Analysis of ARACIS's performance indicators<sup>2</sup>

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

- *general description of the domain analysis.*

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

*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.

**Performance Indicator A.1.1.1.** *The existence of specific regulations and their application at the level of the IOSUD, respectively at the Doctoral School(s):*

*the internal regulations of the administrative structures (the institutional regulations for the organization and conduct of doctoral studies programs, the regulation(s) of Doctoral School(s);*

*(a) the Methodology for conducting elections at the level of the Council of University Doctoral Studies (CSUD), respectively at Doctoral School(s) including elections by the students of their representatives in CSUD/Council of the Doctoral School (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 CSUD/Council of the Doctoral School with evidence of the regularity of meetings;*

*f) the contract for doctoral studies;*

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

- *UPB currently has over 30,000 students in one of three study cycles. The first cycle License (BSc) has a duration of 4 years and 240 credits. The second cycle, Master's degree (MSc), with a duration of 2 years, allows the continuation of studies and specialization for graduates of the first cycle. The scientific consecration is confirmed by the completion of the third cycle, Doctorate, with a duration of 3 years. Postgraduate studies of continuing education or vocational conversion are also organized at UPB.*
- *UPB had 1382 teachers with an indefinite contract, of which 331 teachers, 284 lecturers, 513 heads of papers/readers and 254 assistants. Added to these are 575 associate teachers: Ph.D. students, industry or research specialists, retired UPB professors.*
- *With full respect for the values of academic freedoms and ethical integrity, with the tradition of 197 years of existence, the university has a functional administrative and managerial institutional structure, with defined strategic objectives, to increase professional performance.*
- *UPB is European University Association (EUA), as a full member, and since 2012 a member of the EUA-CDE (European University Association-Council for Doctoral Education), ([www.eua.be](http://www.eua.be)).*
- *The Regulation of the Doctoral School of Automatic and Computers, in force at the date of the internal evaluation, was adopted by the Decision of the General Assembly of SD\_AC members from 23.01.2019 and approved*

<sup>2</sup> *Each time when applicable the information shall be presented genderwise*



page web of SD\_AC: <http://doctorat.acs.pub.ro/componenta-si-organizare/cadru-legislativ/>.

- The methodology for admitting doctoral students in SD\_AC is presented on the web page of SD\_AC, Ph.D. STUDENTS THESES menu, in the Admission 2020-2021 submenu: <http://doctorat.acs.pub.ro/admitere-doctorat/admitere-2020-2021/>, and in the Archive submenu: <http://doctorat.acs.pub.ro/admitere-doctorat/arhiva-admitere/>. SD\_AC defined the methodology for admitting foreign candidates from non-EU countries in doctoral university study programs in the fields of IS and CTI.
- This methodology is available on the SD\_AC website, in the Admission Ph.D. PROGRAM menu, Admission 2020-2021 submenu, at: [http://doctorat.acs.pub.ro/wp-content/uploads/2017/01/Metodologie-SD\\_AC-de-admitere-doctoranzi-non-UE.pdf](http://doctorat.acs.pub.ro/wp-content/uploads/2017/01/Metodologie-SD_AC-de-admitere-doctoranzi-non-UE.pdf).
- The methodology for completing doctoral studies in SD\_AC is presented on the web page of SD\_AC, the Ph.D. STUDENTS THESES menu, Public defences submenu:  
  
<http://doctorat.acs.pub.ro/doctoranzi-si-teze/sustineri-publice/e>) the existence of mechanisms for the recognition of the quality of Ph.D. supervisor and the equivalence of the doctorate obtained in other countries reporting.
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*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.*

- *The regulation of the Doctoral School establishes obligatory criteria, procedures and standards regarding the following aspects:*
  - a) *acceptance of new leading members of the doctorate.*
  - b) *the mechanisms through which the decisions are taken regarding the opportunity, the structure and the content of the training program based on advanced university studies.*
  - c) *the procedures for changing the doctoral supervisor of a certain doctoral student.*
  - d) *the conditions under which the doctoral program may be interrupted.*
  - e) *ways to prevent fraud in scientific research, including plagiarism.*
  - f) *ensuring access to research resources.*
  - g) *the attendance obligations of the doctoral students.*

*Recommendations:*

**The indicator is fulfilled.**

**Performance Indicator\*A.1.1.3<sup>3</sup>.** *Doctoral schools included in IOSUD are organized*



as disciplinary or interdisciplinary disciplines/thematic, according to Article 158, paragraph (7) of the Law of National Education No. 1/2011 with subsequent amendments and additions.

*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.*

***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.***

- *At the level of IOSUD UPB we have electronic platforms for admission (<https://admitere.pub.ro>) for the record and management of students for all educational clicks (<https://studenti.pub.ro>) and the development of teaching activities (<https://curs.upb.ro>).*
- *Distribution of the total number of places by faculties and fields of study for the academic year*
- *The admission competition is addressed to the candidates who meet the provisions.*
- *The structure and timetable are shown graphically below and are fully described.*
- ***Starting with September 30, each student will be able to access their account, created based on the one from admission (<http://admitere.pub.ro>). The authentication is done with the CNP / passport series as username and the same password as the one from the admission.***
- ***Students have access to a database of courses.***

***The indicator is fulfilled.***

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

- *The scientific leaders from SD\_AC have access to and use its TURNITIN computer program to verify the percentage of similarity in all doctoral theses in the IS and CTI fields.*

***The indicator is fulfilled***

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<sup>3</sup> The indicators marked with an asterisk (\*) hold a special status, referring exclusively to the evaluation of doctoral schools, 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 fulfilled, the Agency extends a period of maximum 3 years to IOSUD to correct the respective deficiencies.



## **Criterion A.2. Research infrastructure**

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

- *general description of the standard analysis.*

**Performance Indicator A.2.1.1.** *The IOSUD/the doctoral school(s) present proof of possessing or having rented adequate spaces for research activity specific to doctoral studies (laboratories, experimental fields, research stations, etc.)*

- *The spaces where SD\_AC Ph.D. students can carry out scientific research activities in different areas of the IS fields are specified in annex A\_1\_DOT1.*
- *The PRECIS project was implemented between 12.03.2014 -31.12.2015 and resulted in the construction of a new building to host modern equipped laboratories for the Faculty of Automatic Control and Computers at UPB.*
- *The doctoral students from SD\_AC benefit from the new UPB library inaugurated in 2012, <http://library.pub.ro/>, which has a specialized book fund for the IS doctoral field.*
- *Students have online access to international databases and electronic scientific resources (databases/platforms of full-text scientific journals and bibliographic and bibliometric databases)*

**The indicator is fulfilled.**

**Performance Indicator A.2.1.2.** *The IOSUD/doctoral school(s) has/have collaboration agreements with higher education institutions, research institutes, research networks for joint partnerships and have access to using various research infrastructures; the offer for research services is presented publicly using a dedicated platform.*

- *Collaboration agreement concluded with the Transylvania University of Brasov for the operation in partnership until 2021 of the IBM CloudBurst private cloud platform research infrastructure: "Integrated system for Cloud servicesll, Annex A\_2CloudB".*
- *In 2014, IBM concluded a Collaboration Agreement with UPB, Annex A\_3ccIBM-UPBand a Collaboration Agreement with the A&C faculty, A\_3acIBM\_A&C, which provides for the joint operation of the infrastructure of the IBM Linux Competence Center -IBM property, located in the halls ED311 and ED312 in the ED building of the Faculty of Automatic Control and Computers from UPB -IBM HPC servers, 16 workstations and IBM software licenses for carrying out joint research activities in the IS and CTI fields, Annex A\_2LCC\_IBM.*
- *UPB needs more collaboration activities every year according to the Internationalization Doctoral Study and the quality of resources for this study.*

**The indicator is fulfilled.**

**Performance Indicator A.2.1.3.** *The IOSUD/doctoral school(s) proves that it is/are*



concerned with the permanent renewal of the research infrastructure to provide doctoral students access to updated research resources, by applying to various funding competitions and using their own university resources for acquiring new research infrastructure.

- UPB had some applications for SD\_AC members to various project competitions (<http://doctorat.acs.pub.ro/productia-stiintifica/contracte-de-cercetare/>), OpenStack platform available on the course platform (<https://cloud.curs.pub.ro>),
- Integration with Office 365 resources through the course platform.
- **Recommendation:**
- For UPB like best quality University in Romania is on interest in the future period invest in new applications for building virtual platforms and virtual laboratories. For example, is University STU in Trnava, Prof. Radovan Holoubek, Virtual Laboratory for Robotics.

**The indicator is fulfilled.**

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

Standard A.3.1. At the level of each Doctoral School there are sufficient qualified staff to ensure a quality educational process.

- *general description of the standard analysis.*

**Performance Indicator \*A.3.1.1.** *The share of Doctoral advisors coordinating simultaneously more than 8 doctoral students but not more than 12 during their doctoral studies<sup>4</sup> does not exceed 20%.*

- *Three Ph.D. supervisors currently coordinate more than 8 Ph.D. students. The weight for criterion A.3.1.1 result:  $(3/24) \cdot 100 = 12.5\%$ ,*
- *Eleven Ph.D. supervisors currently coordinate more than 8 Ph.D. students. The weight for the criterion A.3.1.1 result:  $(11/20) \cdot 100 = 55.0\%$  At the level of SD\_AC the weight for criterion A.3.1.1:  $(14/44) \cdot 100 = 31.81\%$*

**The indicator is fulfilled.**

**Performance Indicator A.3.1.2.** *At least 50% of all teaching/research staff involved in teaching/research activities related to training programs for advanced university studies or in individual research/art creation programs have a full-time employment contract for an indefinite period with the IOSUD.*

- *At the level of SD\_AC there are 44 doctoral supervisors (20CTI + 24IS), of which 10 are associate doctoral supervisors (4CTI + 6IS). At SD\_AC level the weight for criterion A.3.1.2:  $(34/44) \cdot 100 = 77.27\%$*

**The indicator is fulfilled.**

<sup>4</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.





## **Domain B. EDUCATIONAL EFFECTIVENESS**

- *general description of the domain analysis.*

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

Standard B.1.1. Candidates admitted to doctoral studies demonstrate academic, research and professional performance and are diversified as social representation and by gender.

- *general description of the standard analysis.*

**Performance Indicator \*B.1.1.1.** 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.

- *The selection criteria and the way of preparing the files for admission to the doctoral cycle are published on the SD\_AC website: <http://doctorat.acs.pub.ro/admitere-doctorat/admitere-2020-2021/>*

*Recommendations:*

***The indicator is fulfilled.***

**Performance Indicator B.1.1.2.** The IOSUD/doctoral school(s) have a policy for stimulating enrolment of doctoral students coming from disadvantaged social environments, by allocating reserved positions in the admission procedure and/or granting special scholarships, as well as organising support programs to prevent drop-outs.

- *IOSUD has a policy of allocating special places for admission of Romanian doctoral students from abroad; SD\_AC enrolled such students in special places from the state budget.*

*Recommendations:*

- *We recommended to a wide area of students from abroad on Doctoral study translated on English language.*

***The indicator is fulfilled.***

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

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

- *general description of the standard analysis.*

**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.

The learning plans developed by Ph.D. leaders for Ph.D. students, provide the following 5 mandatory disciplines:

- Specialized discipline 1(8 ECTS),
- Specialized discipline 2(8 ECTS)
- Discipline Research methodology and scientific authoring (4 ECTS)
- Discipline Ethics of Scientific Research and Intellectual Property (6 ECTS)
- Discipline Project Management (4 ECTS)
- 

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.

- Discipline Ethics of scientific research and intellectual property (6 ECTS) 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<sup>5</sup>.

- The existing mechanism at the level of SD\_AC, quality assurance/feedback for these sheets, consists of the actions in the following sequence:
  1. Analysis of the learning plan from the PPA for each Ph.D. student
  2. Monitoring by the Commission for Guidance of the Ph.D. student of the implementation of the PPA and the completion of validated disciplines
  3. Collection of feedback from Ph.D. students after completion of PPA and the subjects taught, according to the methodology defined by IOSUD UPB.
  4. Formulation of recommendations to the doctoral student, to the leader and the guidance committee to remedy some deficiencies:
  5. Providing additional documentation materials to the doctoral student.
  6. Supplementing the teaching and scientific support provided by the guidance committee.
  7. Updating the content of the discipline to better cover the thematic areas defined by the scientific leader.
  8. Ensuring the conditions appropriate for the doctoral student's repetition of the examination for the promotion of the discipline

Recommendations:

**The indicator is fulfilled.**

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



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

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.*

**Performance Indicator B.3.1.1.** *For the doctoral school there are in place mechanisms for verification of the results of doctoral studies in accordance with the specificity of the particular domain (i.e. technological transfer, products, patents in the case of exact sciences; products and services for social sciences and humanities; festivals, contests, recitals, sports competitions; cultural-arts orders in the vocational domain; presentations at national and international conferences, publication of research results in national and international publications, engaging doctoral students in writing research-development projects etc.)*

- *There is a lot of examples that capitalized results of doctoral study. Recommendations:*

***The indicator is fulfilled.***

## **Criterion B.4. Quality of doctoral theses**

Standard B.4.1. Doctoral theses fulfil high-quality standards

- *general description of the standard analysis.*

**Performance Indicator B.4.1.1.** *At the level of IOSUD, the percentage of theses non-validated, at the level of General Council of the National Council for Attestation of University Degrees, Diplomas and Certificates (CNADTCU), without the right of further amendments and re-organizing the process of public defending, is not exceeding 5% in the last 5 years.*

- *At the level of the Doctoral Schools failed percentage of a doctoral thesis are 0% in the last 5 years.*

*Recommendations:*

***The indicator is fulfilled.***

## **Domain C. QUALITY MANAGEMENT**

- *general description of domain analysis.*

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

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.*

**Performance Indicator C.1.1.1.** *The IOSUD 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 doctoral school(s), 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 academic and social services (including participation in various events, publication of papers, etc.) and counseling made available to doctoral students.*
  - *The evaluation of teachers by the students is done based on some questionnaires, using the specific section on the Moodle Platform of UPB and/or questionnaires elaborated by the managements of the faculties and respectively of the doctoral schools.*
  - *Following the provisions of the National Education Law no. 1/2011 in the University POLITEHNICA of Bucharest, the self-evaluation and evaluation of the teachers are performed annually, using the procedure approved annually by the UPB Senate.*
  - *The research infrastructure involved in the field of doctoral studies in Energy Engineering consists of the laboratories and research facilities of the departments and research centers of the faculty.*

*Recommendations:*

***The indicator is fulfilled.***

**Performance Indicator C.1.1.2.** *Students' associations and, according to the case, representatives of students organise elections in the community of doctoral students, for positions in the CSUD, by universal vote, direct and secret, all doctoral students having the right of electing or being elected.*

- *Doctoral students elect, among themselves, by universal, direct, and secret ballot, all doctoral students having the right to elect and be elected, representatives in the Council of University Doctoral Studies.*
- *The mandate of the representatives in the Council of University Doctoral Studies ends now of the public defence of the thesis or at the end of the mandate.*

*Recommendations:*

***The indicator is fulfilled.***

**Performance Indicator C.1.1.3.** *Students' associations and, according to the case, representatives of students organise elections in the community of doctoral students at the level of each doctoral school, for positions in the councils of doctoral schools, by universal vote, direct and secret, all doctoral students having the right of electing or being elected.*

- *Doctoral students elect, among themselves, by universal, direct and secret ballot, all doctoral students having the right to elect and be elected,*



*representatives in the Council of Doctoral Studies.*

- *The mandate of the representatives in the Council of Doctoral Studies ends at the moment of the public defense of the thesis or the end of the mandate*

*Recommendations:*

***The indicator is fulfilled.***

***Performance Indicator \*C.1.1.4.*** *Following the internal evaluation, IOSUD and the doctoral schools draft strategies and policies aiming to eliminate the identified deficiencies and to stimulate scientific and academic performance of IOSUD.*

- *At the level of Doctoral Schools, an analysis is performed regarding the evaluation of doctoral supervisors taking into account the result of their evaluation at the department level and the evaluation by students and the necessary measures are established which are variable according to the provisions of the Doctoral School Regulations.*

*Recommendations:*

***The indicator is fulfilled.***

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

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.*

***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 IOSUD/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 the training study 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) information on the opportunities for doctoral students aiming to attend conferences, to publish articles, awarding scholarships, etc.*

*(j) links to the doctoral thesis's 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.*

- *The doctoral schools publish a website with doctoral study contact, contract, thematic areas, list of Ph.D. students, information about elaboration standards and list of abstracts of published thesis.*



*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.*

***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.***

- All doctoral students from UPB have access to the scientific literature to sustain the Romanian research and education system –ANELIS PLUS 2020.
- The Databases available for access are:
- ScienceDirect <http://www.sciencedirect.com/>
- Springer <http://link.springer.com/>
- ISI Web of Science <http://isiknowledge.com>
- Scopus <http://www.scopus.com/home>.

*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.***

- *After completing the doctoral thesis developed in the Energy Doctoral School, the thesis and abstracts will go through an analysis of similarities with the Tunrnitin program, provided by IOSUD-UPB.*

*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.***

*Recommendations:*

***The indicator is fulfilled.***

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

Standard C.3.1. IOSUD/Doctoral school has a strategy in place, and it is applied to enhance the internationalization of doctoral studies.

- *general description of the standard analysis.*

***Performance Indicator \*C.3.1.1. IOSUD, for every doctoral school, 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.*

- *University had 55 Erasmus agreements, but at least 20% of doctoral students have completed an internship abroad or another form of mobility.*

*Recommendations:*

- *Increasing of the number of mobility agreements with foreign universities, research institutes, companies that work in the field of study, which aim at the mobility of doctoral students and academic staff, which is currently at the lower limit of 20%.*

***The indicator is fulfilled.***

***Performance Indicator C.3.1.2.*** *IOSUD supports, including providing financial support, to the organization of doctoral studies in international co-tutelage or invitation of leading experts to deliver courses/lectures for doctoral students.*

- *International Ph.D. co-supervision theses ongoing in the Power Engineering Ph.D. school had 7 Ph.D. thesis from 2014. To 2017. like international co-supervision theses*
- *This is 15,22 % from all theses.*

*Recommendations:*

- *Increasing the number of doctoral studies in international co-tutelage, as well as the invitation of leading experts to deliver courses/lectures for doctoral students.*

-

***The indicator is fulfilled.***

***Performance Indicator \*C.3.1.3.*** *At least 10% of the doctoral theses of every doctoral schools of the IOSUD are drafted and/or submitted in an international foreign language or are organised in international co-tutelage.*

- *The number of Ph.D. co-supervision theses in a foreign language is 15.27% for Energy Doctoral school*

*Recommendations:*

***The indicator is fulfilled.***

***Performance Indicator C.3.1.4.*** *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<sup>6</sup> etc.).*

- *UPB participates in the following working groups: IDT Innovative Doctoral Training; TFE – Task Force Entrepreneurship; GES -Gender Equality Survey; RI –Research Infrastructure; HR –Human Resources in Academia.*
- *UPB participated in 2016-2020 in 38 educational fairs to attract international doctoral students.*





Recommendations:

**The indicator is fulfilled.**

#### **Criterion C.4. System for assurance of ethical and academic integrity**

Standard C.4.1. IOSUD/Doctoral school has a functional and efficient system in place for prevention and assuring ethical and academic integrity norms.

- *general description of the standard analysis.*

**Performance Indicator C.4.1.1.** *IOSUD, applies the current provisions regulating ethics, deontology/academic integrity, respectively to academic freedom and has developed:*

- *policies based on prevention regarding possible violations of the Code of ethics and academic integrity, demonstrated by public positioning, studies, analyses or measures taken.*
- *practices and mechanisms for preventing fraud, from an institutional perspective as well as from the perspective of the doctoral students;*
- *practices for preventing possible fraud in academic activity, research or any other activity, including active measures for preventing and avoiding plagiarism of any kind, as well as promoting ethical and integrity/deontology principles or observing intellectual property norms, authors' rights and other related rights, among all members of the academic community;*
- *administrative instruments which allow applying effective and eliminatory sanctions;*
- *mechanisms and measures to assure equal opportunities and protection against intolerance and discrimination of any kind;*

*IOSUD monitors and permanently evaluates these practices and can prove they are applied to all activities and engagement of students in all these processes, and the results of the monitoring is made public yearly or whenever it becomes necessary.*

- *Academic integrity, strengthening the spirit of the academic community, is achieved by promoting some principles:*
- *cultivating the principle of transparency in relations with internal and external partners;*
- *promoting an organizational culture based on performance and probity;*
- *stimulating consultative and flexible working methods and techniques;*
- *the existence of internal mechanisms to ensure the integrity and elimination of the conflict of interests*
- *developing partnership relations with public and private organizations to support the process of rapid and dynamic integration of graduates in economic and social life, by identifying and occupying a job in accordance with graduate studies;*

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<sup>6</sup> Doctoral studies are completed by presenting the doctoral thesis in public session in front of a committee whose members hear and judge the final public presentation of the thesis

- *discouraging and eliminating any forms of corruption;*



- *investigating trends in socio-economic change and elastic, rapid adaptation to new requirements.*

*Recommendations:*

***The indicator is fulfilled.***

***Performance Indicator C.4.1.2.*** *All intimations regarding suspicion of plagiarism related to doctoral theses have been analysed and resolved by the IOSUD within the time interval legally established for expressing in writing its position regarding the intimation received.*

- *All notifications regarding plagiarism suspicions related to doctoral theses are analyzed and resolved by IOSUD within the legal term provided for expressing the written point of view compared to the received notification.*

*Recommendations:*

***The indicator is fulfilled***

***Performance Indicator C.4.1.3.*** *Annual Reports of the Ethics commission of the IOSUD contain information on the stage of solving each case of intimation or own-initiative intimation regarding violation of norms or ethical aspects relevant for university doctoral studies. description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.*

*Recommendations:*

***The indicator is fulfilled.***

***Performance Indicator C.4.1.4.*** *The measures taken by IOSUD after the final decision of CNADTCU to withdraw the title of "doctor" following accusations of plagiarism have addressed all the aspects mentioned in CNADTCU's decision and in the current legislation.*

- *The annual reports of the IOSUD Ethics Commission contain information on the status of each case in which there was a notification or self-notification relevant to doctoral studies regarding the violation of certain norms and ethical issues.*

*Recommendations:*

***The indicator is fulfilled.***

***Performance Indicator C.4.1.5.*** *The measures aiming to prevent academic fraud in the doctoral studies, taken by IOSUD, could be:*

- Suspension of the right to advise newly enrolled doctoral students, for a period of 3 years, in the case of doctoral advisors having coordinated a doctoral thesis with a definitive decision of withdrawal of the "doctor" title for plagiarism;*
- Exclusion from the IOSUD of the doctoral advisor having coordinated at least two doctoral theses with definitive decisions of withdrawal of the "doctor" title for plagiarism;*
- Suspension of the right to organize the admission process of new doctoral students in the Doctoral studies domain, for a period of 2 years, if in the respective domain a*



doctoral thesis has been finalized and defended with a definitive decision of withdrawal of the “doctor” title for plagiarism.

- At the IOSUD-UPB level, it was not necessary to take measures on the scientific referents who were part of the commissions for public support of two or more doctoral theses with a final decision to withdraw the doctoral degree for plagiarism.

*Recommendations:*

**The indicator is fulfilled.**

**Performance Indicator \*C.4.1.6.** *The scientific reviewers members in the commissions for public defense of two or more doctoral theses with definitive decisions of withdrawal of the “doctor” title for plagiarism, have not been nominated in other commissions for public defence of doctoral theses for a period of at least 3 years.*

- The doctoral thesis is a public document and can be consulted at the university library (<http://www.library.pub.ro/doc/teza2.pdf>).

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*Recommendations:*

**The indicator is fulfilled.**

**Performance Indicator C.4.1.7.** *IOSUD has a database open to the public containing all the doctoral theses defended in the institution beginning at least in 2016 in a format including: the domain, author, doctoral advisor, title of the thesis and the thesis in electronic format (if there is an agreement of the author).*

- The online catalog of the UPB library allows searching in a database with doctoral theses, displaying the field, the author, the doctoral supervisor, the thesis title and the doctoral thesis in electronic format (if there is the author's consent).

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*Recommendations:*

**The indicator is fulfilled.**

## **IV.SWOT Analysis**

**Strengths:**

*UPB currently has over 30,000 students in one of three study cycles.*

*The first cycle License(BSc) has a duration of 4 years and 240 credits. The second cycle, Master's degree (MSc), with a duration of 2 years and finally Doctorate, with a duration of 3 years.*

*Postgraduate studies of continuing education or vocational conversion are also organized at UPB*

*UPB had 1382 teachers with an indefinite contract, of which 331 teachers, 284 lecturers, 513 heads of papers/readers and 254 assistants. Added to these are 575 associate teachers: PhD students, industry or research specialists, retired UPB professors.*

*UPB had the tradition of 197 years of existence, the university has a functional administrative and managerial institutional structure, with defined strategic objectives, in order to increase professional performance.*

*UPB is European University Association(EUA),as a full member, and since 2012 a member of the EUA-CDE (European University Association-Council for Doctoral Education), ([www.eua.be](http://www.eua.be))*

*Collaboration agreement concluded with the Transilvania University of Brasov for the operation in partnership until 2021 of the IBM CloudBurst private cloud platform research infrastructure: "Integrated system for Cloud servicesII, Annex A\_2CloudB".*

*In 2014, IBM concluded a Collaboration Agreement with UPB, Annex A\_3ccIBM-UPB and a Collaboration Agreement with the A&C faculty, A\_3acIBM\_A&C, which provides for the joint operation of the infrastructure of the IBM Linux Competence Center -IBM property, located in the halls ED311 and ED312 in the ED building of the Faculty of Automatic Control and Computers from UPB -IBM HPC servers, 16 workstations and IBM software licenses for carrying out joint research activities in the IS and CTI fields, Annex A\_2LCC\_IBM*

**Weaknesses:**

*UPB need more collaboration activities every year according with Internationalization DoCtoral Study and quality of resurse for this study*

*UPB must in future period invest in new aplication for building virtual platform and virtual laboratories like on some Universities in EU (University STU in Trnava, Prof. Radovan Holoubek, Virtual Laboratory for Robotic).*

*We recommended to wide area of students from abroad on Doctoral study on English.*

*.IOSUD has a policy of allocating special places for admission of Romanian doctoral students from abroad ; SD\_AC enrolled such students in special places from the state budget.*

*There is a lot of examples that capitalized results of doctoral study*

*Academic integrity, strengthening the spirit of academic community, is achieved by promoting some principles:*

- cultivating the principle of transparency in relations with internal and external partners;*
- promoting an organizational culture based on performance and probity;*
- stimulating consultative and flexible working methods and techniques;*
- the existence of internal mechanisms to ensure the integrity and elimination of the conflict of interests*
- developing partnership relations with public and private organizations to support the process of rapid and dynamic integration of graduates in economic and social life, by identifying and occupying a job in accordance with graduate studies;*
- discouraging and eliminating any forms of corruption;*
- investigating trends in socio-economic change and elastic, rapid adaptation to new requirements.*

*The doctoral thesis is a public document and can be consulted at the university library (<http://www.library.pub.ro/doc/teza2.pdf>).*

*The online catalog of the UPB library allows searching in a database with doctoral theses, displaying the field, the author, the doctoral supervisor, the thesis title and the doctoral thesis in electronic format (if there is the author's consent).*

**Opportunities:**

The regulation of the Doctoral School establishes obligatory criteria, procedures and standards regarding the following aspects of EU standards.

Students have access to electronic platform with all thinks needed for PhD study.

The spaces where SD\_AC PhD students can carry out scientific research activities in different areas of the IS fields are specified in annex A\_1\_DOT1.

The PRECIS project was implemented between 12.03.2014 - 31.12.2015 and resulted in the construction of a new building to host modernly equipped laboratories for the Faculty of Automatic Control and Computers at UPB.

The doctoral students from SD\_AC benefit from the new UPB library inaugurated in 2012, <http://library.pub.ro/>, which has a specialized book fund for the IS doctoral field.

Students have online access to international databases and electronic scientific resources (databases / platforms of full-text scientific journals and bibliographic and bibliometric databases), assessed institution, the uniqueness of the study programs and their relevance to the local/national market, the overall attractiveness of the study programs etc.

UPB had some application for SD\_AC members to various project competitions (<http://doctorat.acs.pub.ro/productia-stiintifica/contracte-de-cercetare/>),

OpenStack platform available on the course platform (<https://cloud.curs.pub.ro>),

Integration with Office 365 resources trough the course platform.

Three PhD supervisors currently coordinate more than 8 PhD students. The weight for criterion A.3.1.1 result:  $(3/24) \cdot 100 = 12.5\%$ ,

Eleven PhD supervisors currently coordinate more than 8 PhD students. The weight for the criterion A.3.1.1 result:  $(11/20) \cdot 100 =$

**Threats:**

University had a 55 Erasmus agriments, but at least 20% of doctoral students have completed an intership abroad or another form of mobility.

University need more foreign students on English language, PhD study must be internationalized and fully prepared on English. International PhD co-supervision theses ongoing in the Power Engineering PhD school had 7 PhD thesis from 2014. To 2017. like international co-supervision theses

- This is 15,22 % from all theses.
- This is not too much and in a future must be increased.



55.0 % At the level of SD\_AC the weight for

criterion A.3.1.1:  $(14/44) \cdot 100 = 31.81\%$

The learning plans developed by PhD leaders for PhD students, provide the following 5 mandatory disciplines:

- Specialized discipline 1(8 ECTS),
- Specialized discipline 2(8 ECTS)
- Discipline Research methodology and scientific authoring(4 ECTS)
- Discipline Ethics of Scientific Research and Intellectual Property(6 ECTS)
- Discipline Project Management(4 ECTS)

At the level of the Doctoral Schools failed percentage of doctoral thesis are 0% in the last 5 years.

The evaluation of teachers by the students is done on the basis of some questionnaires, using the specific section on the Moodle Platform of UPB and / or questionnaires elaborated by the managements of the faculties and respectively of the doctoral schools

In accordance with the provisions of the National Education Law no. 1/2011in the University POLITEHNICA of Bucharest, the self-evaluation and evaluation of the teachers is performed annually, using the procedure approved annually by the UPB Senate.

The research infrastructure involved in the field of doctoral studies in Energy Engineering consists of the laboratories and research facilities of the departments and research centres of the faculty.

Doctoral students elect, among themselves, by universal, direct and secret ballot, all doctoral students having the right to elect and be elected, representatives in the Council of Doctoral Studies.

The mandate of the representatives in the Council of Doctoral Studies ends at the moment of the public defense of the thesis or at the end of the mandate

At the level of Doctoral Schools, an analysis is performed regarding the evaluation of doctoral supervisors taking into account the result of their evaluation at the department level and the evaluation by

students and the necessary measures are established which are variable according to the provisions of the Doctoral School Regulations.

The doctoral schools publishes website with doctoral study contact, contract, thematic areas, list of PhD students, information about elaboration standars an list of abstract of published thesis.

All doctoral students from UPB have access to the scientific literature to sustain the Romanian research and education system – ANELIS PLUS 2020

The Databases available for access are:

- ScienceDirect\_

<http://www.sciencedirect.com/>

- Springer <http://link.springer.com/>

- ISI Web of Science\_

<http://isiknowledge.com>

- Scopus

<http://www.scopus.com/home>.

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UPB participates in the following working groups: IDT Innovative Doctoral Training; TFE – Task Force Entrepreneurship; GES -Gender Equality Survey; RI –Research Infrastructure ; HR Human Resources in Academia.

UPB participated in 2016-2020 in 38 educational fairs to attract international doctoral students.

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

No .	Type of indicator (*, C)	Performance indicator	Judgment	Recommendations
1	A.1.1.1.	<p>The existence of specific regulations and their application at the level of the IOSUD, respectively at the Doctoral School(s):</p> <p>a) the internal regulations of the administrative structures (the institutional regulations for the organization and conduct of doctoral studies programs, the regulation(s) of Doctoral School(s);</p> <p>b) the Methodology for conducting elections at the level of the Council of University Doctoral Studies (CSUD), respectively at Doctoral School(s) including elections by the students of their representatives in CSUD/Council of the Doctoral School (CSD) and the evidence of their conduct;</p> <p>c) the Methodologies for organizing and conducting doctoral studies for the admission of doctoral students, for the</p>	<ul style="list-style-type: none"> <li>- UPB currently has over 30,000 students in one of three study cycles. The first cycle License(BSc) has a duration of 4 years and 240 credits. The second cycle, Master's degree (MSc), with a duration of 2 years, allows the continuation of studies and specialization for graduates of the first cycle. The scientific consecration is confirmed by the completion of the third cycle, Doctorate, with a duration of 3 years. Postgraduate studies of continuing education or vocational conversion are also organized at UPB.</li> <li>- UPB had 1382 teachers with an indefinite contract, of which 331 teachers, 284 lecturers, 513 heads of papers/readers and 254 assistants. Added to these are 575 associate teachers: Ph.D. students, industry or research specialists, retired UPB professors.</li> <li>- With full respect for the values of academic freedoms and ethical integrity, with the tradition of 197 years of existence, the university has a functional administrative and managerial institutional structure, with defined strategic objectives, to increase professional performance.</li> <li>- UPB is European University Association(EUA), as a full member, and since 2012 a member of the EUA-CDE (European University Association-Council for Doctoral Education), (<a href="http://www.eua.be">www.eua.be</a>).</li> <li>- The Regulation of the Doctoral School of Automatic and Computers, in force at the date of the internal evaluation, was adopted by the Decision of the General Assembly of SD_AC members from 23.01.2019 and approved by CSUD IOSUD UPB on 06.02.2019 being available for consultation on-page web of SD_AC: <a href="http://doctorat.acs.pub.ro/componenta-si-organizare/cadru-legislativ/">http://doctorat.acs.pub.ro/componenta-si-organizare/cadru-legislativ/</a>.</li> <li>- The methodology for admitting doctoral students in SD_AC is presented on the web page of SD_AC, Ph.D. STUDENTS</li> </ul>	<b>The indicator is fulfilled</b>

		<p>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</p>	<p>THESES menu, in the Admission 2020-2021 submenu: <a href="http://doctorat.acs.pub.ro/admitere-doctorat/admitere-2020-2021/">http://doctorat.acs.pub.ro/admitere-doctorat/admitere-2020-2021/</a>, and in the Archive submenu: <a href="http://doctorat.acs.pub.ro/admitere-doctorat/arhiva-admitere/.SD_AC">http://doctorat.acs.pub.ro/admitere-doctorat/arhiva-admitere/.SD_AC</a> defined the methodology for admitting foreign candidates from non-EU countries in doctoral university study programs in the fields of IS and CTI</p>	
		<p>e) functional management structures</p> <p>CSUD/Council of the Doctoral School with evidence of the regularity of meetings;</p> <p>f) the contract for doctoral studies;</p> <p>g) internal procedures for the analysis and approval of proposals about doctoral study programs based on advanced academic studies.</p>	<p>.This methodology is available on the SD_AC website, in the Admission Ph.D. PROGRAM menu, Admission 2020-2021 submenu, at: <a href="http://doctorat.acs.pub.ro/wp-content/uploads/2017/01/Metodologie-SD_AC-de-admitere-doctoranzi-non-UE.pdf">http://doctorat.acs.pub.ro/wp-content/uploads/2017/01/Metodologie-SD_AC-de-admitere-doctoranzi-non-UE.pdf</a>.</p> <p>- The methodology for completing doctoral studies in SD_AC is presented on the web page of SD_AC, the Ph.D. STUDENTS THESES menu, Public defenses submenu: <a href="http://doctorat.acs.pub.ro/doctozanzi-si-teze/sustineri-publice/.e">http://doctorat.acs.pub.ro/doctozanzi-si-teze/sustineri-publice/.e</a>) the existence of mechanisms for the recognition of the quality of Ph.D. supervisor and the equivalence of the doctorate obtained in other countries reporting:</p>	
	<p><b>A.1.1.2.</b></p>	<p>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</p>	<p>- The regulation of the Doctoral School establishes obligatory criteria, procedures and standards regarding the following aspects:</p> <p>h) acceptance of new leading members of the doctorate.</p> <p>i) the mechanisms through which the decisions are taken regarding the opportunity, the structure and the content of the training program based on advanced university studies</p> <p>j) the procedures for changing the doctoral supervisor of a certain doctoral student</p>	<p><b>The indicator is fulfilled.</b></p>

		additions.	<p>k) the conditions under which the doctoral program may be interrupted</p> <p>l) ways to prevent fraud in scientific research, including plagiarism</p> <p>m) ensuring access to research resources</p> <p>n) the attendance obligations of the doctoral students</p>	
	<b>A.1.1.3.</b>	<p>Doctoral schools included in IOSUD are organized as disciplinary or interdisciplinary disciplines/thematic, according to Article 158, paragraph (7) of the Law of National Education No. 1/2011 with subsequent</p>		<b>The indicator is fulfilled</b>
		amendments and additions.		
<b>2</b>	<b>A.1.2.1.</b>	<p>The existence and effectiveness of an appropriate IT system to keep track of doctoral students and their academic background.</p>	<ul style="list-style-type: none"> <li>- At the level of IOSUD UPB we have electronic platforms for admission (<a href="https://admitere.pub.ro">https://admitere.pub.ro</a>) for the record and management of students for all educational clicks (<a href="https://studenti.pub.ro">https://studenti.pub.ro</a>) and the development of teaching activities (<a href="https://curs.upb.ro">https://curs.upb.ro</a>).</li> <li>- Distribution of the total number of places by faculties and fields of study for the academic year</li> <li>- The admission competition is addressed to the candidates who meet the provisions.</li> <li>- The structure and timetable are shown graphically below and are fully described.</li> <li>- <b>Starting with September 30</b>, each student will be able to access their account, created based on the one from admission (<a href="http://admitere.pub.ro">http://admitere.pub.ro</a>). The authentication is done with the CNP / passport series as username and the same password as the one from the admission.</li> <li>- <b>Students have access to a database of courses.</b></li> </ul>	<b>The indicator is fulfilled.</b>

3	A.2.1.1	<p>The IOSUD/the doctoral school(s) present proof of possessing or having rented adequate spaces for research activity specific to doctoral studies (laboratories, experimental fields, research stations, etc.)</p>	<ul style="list-style-type: none"> <li>- The spaces where SD_AC Ph.D. students can carry out scientific research activities in different areas of the IS fields are specified in annex A_1_DOT1.</li> <li>- The PRECIS project was implemented between 12.03.2014 -31.12.2015 and resulted in the construction of a new building to host modernly equipped laboratories for the Faculty of Automatic Control and Computers at UPB.</li> <li>- The doctoral students from SD_AC benefit from the new UPB library inaugurated in 2012, <a href="http://library.pub.ro/">http://library.pub.ro/</a>, which has a specialized book fund for the IS doctoral field.</li> <li>- Students have online access to international databases and electronic scientific resources (databases/platforms of full-text scientific journals and bibliographic and bibliometric databases)</li> </ul>	<p><b>The indicator is fulfilled.</b></p>
4	A.2.1.3.	<p>The IOSUD/doctoral school(s) proves that it is/are concerned with the permanent renewal of the research infrastructure to provide doctoral students access to updated research resources, by applying to various funding competitions and using their own university resources for acquiring new research infrastructure.</p>	<ul style="list-style-type: none"> <li>- UPB had some applications for SD_AC members to various project competitions (<a href="http://doctorat.acs.pub.ro/productia-stiintifica/contracte-de-cercetare/">http://doctorat.acs.pub.ro/productia-stiintifica/contracte-de-cercetare/</a>), OpenStack platform available on the course platform (<a href="https://cloud.curs.pub.ro/">https://cloud.curs.pub.ro/</a>),</li> <li>- Integration with Office 365 resources through the course platform.</li> <li>- UPB must in the future period invest in new applications for building virtual platforms and virtual laboratories. For example is University STU in Trnava, Prof. Radovan Holoubek, Virtual Laboratory for Robotics</li> </ul>	<p><b>The indicator is fulfilled.</b></p>
	*A.3.1.1.	<p>The share of Doctoral advisors coordinating simultaneously more than 8 doctoral students but not more than 12 during their doctoral studies<sup>7</sup> does not exceed 20%.</p>	<ul style="list-style-type: none"> <li>- Three Ph.D. supervisors currently coordinate more than 8 Ph.D. students. The weight for criterion A.3.1.1 result: <math>(3/24) \cdot 100 = 12.5\%</math>,</li> <li>- Eleven Ph.D. supervisors currently coordinate more than 8 Ph.D. students. The weight for the criterion A.3.1.1 result: <math>(11/20) \cdot 100 = 55.0\%</math> At the level of SD_AC the weight for criterion A.3.1.1: <math>(14/44) \cdot 100 = 31.81\%</math></li> </ul>	<p><b>The indicator is fulfilled.</b></p>



	<b>A.3.1.2.</b>	<i>At least 50% of all teaching/research staff involved in teaching/research activities related to training programs for advanced university studies or in individual research/art creation programs have a full-time employment contract for an indefinite period with the IOSUD.</i>	<i>- At the level of SD_AC there are 44 doctoral supervisors (20CTI + 24IS), of which 10 are associate doctoral supervisors (4CTI + 6IS).At SD_AC level the weight for criterion A.3.1.2: <math>(34/44) \cdot 100 = 77.27\%</math></i>	<b>The indicator is fulfilled</b>
	<b>*B.1.1.1.</b>	<i>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.</i>	<i>- The selection criteria and the way of preparing the files for admission to the doctoral cycle are published on the SD_AC website: <a href="http://doctorat.acs.pub.ro/admitere-doctorat/admitere-2020-2021/">http://doctorat.acs.pub.ro/admitere-doctorat/admitere-2020-2021/</a></i>	<b>The indicator is fulfilled.</b>
5	<b>B.1.1.2.</b>	<i>The IOSUD/doctoral school(s) have a policy for stimulating enrollment of doctoral students coming from disadvantaged social environments, by allocating reserved positions in the admission procedure and/or granting special scholarships, as well as organising</i>	<i>- IOSUD has a policy of allocating special places for admission of Romanian doctoral students from abroad; SD_AC enrolled such students in special places from the state budget.  - We recommended to a wide area of students from abroad on Doctoral study on English</i>	<b>The indicator is fulfilled.</b>

		support programs to prevent drop-outs.		
6	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.	<p>The learning plans developed by Ph.D. leaders for Ph.D. students, provide the following 5 mandatory disciplines:</p> <ul style="list-style-type: none"> <li>- Specialized discipline 1(8 ECTS),</li> <li>- Specialized discipline 2(8 ECTS)</li> <li>- Discipline Research methodology and scientific authoring(4 ECTS)</li> <li>- Discipline Ethics of Scientific Research and Intellectual Property(6 ECTS)</li> <li>- Discipline Project Management(4 ECTS)</li> </ul>	<b>The indicator is fulfilled.</b>
7	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.	<ul style="list-style-type: none"> <li>- Discipline Ethics of scientific research and intellectual property (6 ETCS)</li> </ul>	<b>The indicator is fulfilled.</b>
8	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	<ul style="list-style-type: none"> <li>- The existing mechanism at the level of SD_AC, quality assurance/feedback for these sheets, consists of the actions in the following sequence:</li> <li>9. Analysis of the learning plan from the PPA for each Ph.D. student</li> <li>10. Monitoring by the Commission for Guidance of the Ph.D. student of the implementation of the PPA and the completion of validated disciplines</li> <li>12. Collection of feedback from Ph.D. students after completion of PPA and the subjects taught, according to the methodology defined by IOSUD UPB.</li> <li>13. Formulation of recommendations to the doctoral student, to the leader and the guidance committee to remedy some deficiencies:</li> <li>14. Providing additional documentation materials to the doctoral student;</li> <li>15. Supplementing the teaching and scientific support provided by the</li> </ul>	<b>The indicator is fulfilled.</b>

			<p>guidance committee;</p> <p>16. Updating the content of the discipline to better cover the thematic areas defined by the scientific leader.</p> <p>17. Ensuring the conditions appropriate for the doctoral student's repetition of the examination for the promotion of the discipline</p>	
9	<b>B.3.1.1.</b>	<p><i>For the doctoral school there are in place mechanisms for valorification of the results of doctoral studies in accordance with the specificity of the particular domain (i.e. technological transfer, products, patents in the case of exact sciences; products and services for social sciences and humanities; festivals, contests, recitals, sports competitions; cultural-arts orders in the vocational domain; presentations at national and international conferences, publication of research results in national and international publications, engaging doctoral students in writing research-development projects etc.)</i></p>	<p>- There is a lot of examples that capitalized results of doctoral study.</p>	<p><b>The indicator is fulfilled.</b></p>

<sup>8</sup> Or by what the graduate should know, understand and to be able to do, according to the provisions of the Methodology regarding inscription and registration of higher education qualifications in the the National Register of Qualifications in Higher Education (RNCIS) approved by the Order No.3475/2017 with subsequent amendments and additions.

10	<b>B.4.1.1.</b>	At the level of IOSUD, the percentage of theses non-validated, at the level of General Council of the National Council for Attestation of University Degrees, Diplomas and Certificates (CNADTCU), without the right of further amendments and re-organizing the process of public defending, is not exceeding 5% in the last 5 years.	- At the level of the Doctoral Schools failed percentage of a doctoral thesis are 0% in the last 5 years.	<b>The indicator is fulfilled.</b>
11	<b>C.1.1.1.</b>	The IOSUD 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 doctoral school(s), 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 academic and social services (including participation in various events, publication of papers, etc.) and counseling made available to doctoral students.	<ul style="list-style-type: none"> <li>- The evaluation of teachers by the students is done based on some questionnaires, using the specific section on the Moodle Platform of UPB and/or questionnaires elaborated by the managements of the faculties and respectively of the doctoral schools</li> <li>- Following the provisions of the National Education Law no. 1/2011 in the University POLITEHNICA of Bucharest, the self- evaluation and evaluation of the teachers are performed annually, using the procedure approved annually by the UPB Senate.</li> <li>- The research infrastructure involved in the field of doctoral studies in Energy Engineering consists of the laboratories and research facilities of the departments and research centers of the faculty.</li> </ul>	<b>The indicator is fulfilled.</b>
12	<b>C.1.1.2.</b>	Students' associations and, according to the case, representatives	- Doctoral students elect, among themselves, by universal, direct and secret ballot, all doctoral students having the right to elect	<b>The indicator is fulfilled.</b>

		<p>of students organise elections in the community of doctoral students, for positions in the CSUD, by universal vote, direct and secret, all doctoral students having the right of electing or being elected.</p>	<p>and be elected, representatives in the Council of University Doctoral Studies.</p> <ul style="list-style-type: none"> <li>- The mandate of the representatives in the Council of University Doctoral Studies ends at the moment of the public defense of the thesis or at the end of the mandate.</li> </ul>	
13	C.1.1.3.	<p>Students' associations and, according to the case, representatives of students organise elections in the community of doctoral students at the level of each doctoral school, for positions in the councils of doctoral schools, by universal vote, direct and secret, all doctoral students having the right of electing or being elected.</p>	<ul style="list-style-type: none"> <li>- Doctoral students elect, among themselves, by universal, direct and secret ballot, all doctoral students having the right to elect and be elected, representatives in the Council of Doctoral Studies.</li> <li>- The mandate of the representatives in the Council of Doctoral Studies ends at the moment of the public defense of the thesis or the end of the mandate</li> </ul>	<b>The indicator is fulfilled.</b>
14	*C.1.1.4.	<p>Following the internal evaluation, IOSUD and the doctoral schools draft strategies and policies aiming to eliminate the identified deficiencies and to stimulate scientific and academic performance of IOSUD.</p>	<ul style="list-style-type: none"> <li>- At the level of Doctoral Schools, an analysis is performed regarding the evaluation of doctoral supervisors taking into account the result of their evaluation at the department level and the evaluation by students and the necessary measures are established which are variable according to the provisions of the Doctoral School Regulations.</li> </ul>	<b>The indicator is fulfilled.</b>
15	C.2.1.1.	<p>The IOSUD publishes on the website of the organizing institution, in compliance with the general regulations on data protection, information such as:</p> <ul style="list-style-type: none"> <li>(a) the IOSUD/Doctoral School regulation;</li> <li>(b) the admission regulation;</li> <li>(c) the doctoral studies contract;</li> </ul>	<ul style="list-style-type: none"> <li>- The doctoral schools publish a website with doctoral study contact, contract, thematic areas, list of Ph.D. students, information about elaboration standards and a list of abstracts of published theses.</li> </ul>	<b>The indicator is fulfilled.</b>

		<p>(d)the study completion regulation including the procedure for the public presentation of the thesis;</p> <p>(e)the content of the training study program based on advanced academic studies;</p> <p>(f)the academic and scientific profile, thematic areas/research themes of the Doctoral advisors within the domain, as well as their institutional contact data;</p> <p>(g)the list of doctoral students within the domain with necessary information (year of registration; Advisor);</p> <p>(h)information on the standards for developing the doctoral thesis;</p> <p>(i)information on the opportunities for doctoral students aiming to attend conferences, to publish articles, awarding scholarships, etc.</p> <p>(j)links to the doctoral theses's 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.</p>		
16	C.2.2.1.	<p>All doctoral students have free access to one platform providing academic databases relevant to the doctoral</p>	<ul style="list-style-type: none"> <li>- All doctoral students from UPB have access to the scientific literature to sustain the Romanian research and education system – ANELIS PLUS 2020.</li> <li>- The Databases available for access are:</li> <li>- ScienceDirect_ <a href="http://www.sciencedirect.com/">http://www.sciencedirect.com/</a></li> </ul>	<p><b>The indicator is fulfilled.</b></p>



		<i>studies domain of the their thesis.</i>	<ul style="list-style-type: none"> <li>- Springer <a href="http://link.springer.com/">http://link.springer.com/</a></li> <li>- ISI Web of Science <a href="http://isiknowledge.com">http://isiknowledge.com</a></li> <li>- Scopus <a href="http://www.scopus.com/home">http://www.scopus.com/home</a>.</li> <li>-</li> </ul>	
17	C.2.2.2.	<i>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.</i>	<ul style="list-style-type: none"> <li>- <i>After completing the doctoral thesis developed in the Energy Doctoral School, the thesis and abstracts will go through an analysis of similarities with the Turnitin program, provided by IOSUD-UPB.</i></li> </ul>	<b>The indicator is fulfilled.</b>
17	C.2.2.3.	<i>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.</i>		<b>The indicator is fulfilled.</b>
18	*C.3.1.1.	<i>IOSUD, for every doctoral school, 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</i>	<ul style="list-style-type: none"> <li>- <i>University had 55 Erasmus agreements, but at least 20% of doctoral students have completed an internship abroad or another form of mobility.</i></li> <li>- <i>University needs more foreign students on English language.</i></li> <li>-</li> </ul>	<b>The indicator is fulfilled.</b>

		at least 20%, which is the target at the level of the European Higher Education Area.		
19	C.3.1.2.	IOSUD supports, including providing financial support, to the organization of doctoral studies in international co-tutelage or invitation of leading experts to deliver courses/lectures for doctoral students.	<ul style="list-style-type: none"> <li>- International Ph.D. co-supervision theses ongoing in the Power Engineering Ph.D. school had 7 Ph.D. thesis from 2014. To 2017. like international co-supervision theses</li> <li>- This is 15,22 % from all theses.</li> <li>- This is not too much and in the future must be increased.</li> </ul>	<b>The indicator is fulfilled.</b>
20	*C.3.1.3.	At least 10% of the doctoral theses of every doctoral schools of the IOSUD are drafted and/or submitted in an international foreign language or are organised in international co-tutelage.	<ul style="list-style-type: none"> <li>- The number of Ph.D. co-supervision theses in a foreign language is 15.27% for Energy Doctoral school</li> <li>-</li> </ul>	<b>The indicator is fulfilled.</b>
21	C.3.1.4.	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 <sup>9</sup> etc.).	<ul style="list-style-type: none"> <li>- UPB participates in the following working groups: IDT Innovative Doctoral Training; TFE –Task Force Entrepreneurship; GES - Gender Equality Survey; RI –Research Infrastructure; HR –Human Resources in Academia.</li> <li>- UPB participated in 2016-2020 in 38 educational fairs to attract international doctoral students.</li> <li>-</li> </ul>	<b>The indicator is fulfilled.</b>
22	C.4.1.1.	IOSUD, applies the current provisions regulating ethics, deontology/academic	IOSUD monitors and permanently evaluates these practices and can prove they are applied to all activities and engagement of students in all these	<b>The indicator is fulfilled.</b>

<sup>9</sup> Doctoral studies are completed by presenting the doctoral thesis in public session in front of a committee whose members hear and judge the final public presentation of the thesis

	<p><i>integrity, respectively to academic freedom and has developed: policies based on prevention regarding possible violations of the Code of ethics and academic integrity, demonstrated by public positionings, studies, analyses or measures taken; practices and mechanisms for preventing fraud, from an institutional perspective as well as from the perspective of the doctoral students; practices for preventing possible fraud in academic activity, research or any other activity, including active measures for preventing and avoiding plagiarism of any kind, as well as promoting ethical and integrity/deontology principles or observing intellectual property norms, authors' rights and other related rights, among all members of the academic community; administrative instruments which allow applying effective and eliminatory sanctions; mechanisms and measures to assure equal opportunities and protection against intolerance and discrimination of any kind;</i></p>	<p><i>processes, and the results of the monitoring is made public yearly or whenever it becomes necessary.</i></p> <ul style="list-style-type: none"> <li>- <i>Academic integrity, strengthening the spirit of the academic community, is achieved by promoting some principles:</i></li> <li>- <i>cultivating the principle of transparency in relations with internal and external partners;</i></li> <li>- <i>promoting an organizational culture based on performance and probity;</i></li> <li>- <i>stimulating consultative and flexible working methods and techniques;</i></li> <li>- <i>the existence of internal mechanisms to ensure the integrity and elimination of the conflict of interests</i></li> <li>- <i>developing partnership relations with public and private organizations to support the process of rapid and dynamic integration of graduates in economic and social life, by identifying and occupying a job in accordance with graduate studies;</i></li> <li>- <i>discouraging and eliminating any forms of corruption;</i></li> <li>- <i>investigating trends in socio-economic change and elastic, rapid adaptation to new requirements.</i></li> <li>-</li> </ul>	
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23	C.4.1.2.	All intimations regarding suspicion of plagiarism related to doctoral theses have been analysed and resolved by the IOSUD within the time interval legally established for expressing in writing its position regarding the intimation received.	<ul style="list-style-type: none"> <li>- All notifications regarding plagiarism suspicions related to doctoral theses are analyzed and resolved by IOSUD within the legal term provided for expressing the written point of view compared to the received notification.</li> <li>-</li> </ul>	<b>The indicator is fulfilled.</b>
24	C.4.1.3.	Annual Reports of the Ethics commission of the IOSUD contain information on the stage of solving each case of intimation or own-initiative intimation regarding violation of norms or ethical aspects relevant for university doctoral studies. description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.	<ul style="list-style-type: none"> <li>-</li> </ul>	<b>The indicator is fulfilled.</b>
25	C.4.1.4.	The measures taken by IOSUD after the final decision of CNADTCU to withdraw the title of "doctor" following accusations of plagiarism have addressed all the aspects mentioned in CNADTCU's decision and in the current legislation.	<ul style="list-style-type: none"> <li>- The annual reports of the IOSUD Ethics Commission contain information on the status of each case in which there was a notification or self-notification relevant to doctoral studies regarding the violation of certain norms and ethical issues.</li> <li>-</li> </ul>	<b>The indicator is fulfilled.</b>
26	C.4.1.5.	<p>The measures aiming to prevent academic fraud in the doctoral studies, taken by IOSUD, could be:</p> <p>a) Suspension of the right to advise newly enrolled doctoral students, for a period of 3 years, in the case of doctoral advisors having coordinated a</p>	<ul style="list-style-type: none"> <li>- At the IOSUD-UPB level, it was not necessary to take measures on the scientific referents who were part of the commissions for public support of two or more doctoral theses with a final decision to withdraw the doctoral degree for plagiarism.</li> <li>-</li> </ul>	<b>The indicator is fulfilled.</b>

		<p>doctoral thesis with a definitive decision of withdrawal of the “doctor” title for plagiarism;</p> <p>b) Exclusion from the IOSUD of the doctoral advisor having coordinated at least two doctoral theses with definitive decisions of withdrawal of the “doctor” title for plagiarism;</p> <p>c) Suspension of the right to organize the admission process of new doctoral students in the Doctoral studies domain, for a period of 2 years, if in the respective domain a doctoral thesis has been finalized and defended with a definitive decision of withdrawal of the “doctor” title for plagiarism.</p>		
27	*C.4.1.6.	<p>The scientific reviewers members in the commissions for public defense of two or more doctoral theses with definitive decisions of withdrawal of the “doctor” title for plagiarism, have not been nominated in other commissions for public defence of doctoral theses for a period of at least 3 years</p>	<ul style="list-style-type: none"> <li>- The doctoral thesis is a public document and can be consulted at the university library (<a href="http://www.library.pub.ro/doc/teza2.pdf">http://www.library.pub.ro/doc/teza2.pdf</a>).</li> <li>-</li> </ul>	<p><b>The indicator is fulfilled.</b></p>

28	C.4.1.7.	<p><b>IOSUD has a database open to the public containing all the doctoral theses defended in the institution beginning at least in 2016 in a format including: the domain, author, doctoral advisor, title of the thesis and the thesis in electronic format (if there is an agreement of the author).</b></p>	<p>- The online catalog of the UPB library allows searching in a database with doctoral theses, displaying the field, the author, the doctoral supervisor, the thesis title and the doctoral thesis in electronic format (if there is the author's consent).</p>	<p><b>The indicator is fulfilled.</b></p>
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## VI. Conclusions and general recommendations

After full evaluation UPB Doctoral study, documents and talking with professors, rectors, deans, students and after reading plans and programs, annexes, and all other documents, I have only one decision. UPB is an extremely quality University. All 28 indicators are fulfilled. In the future, UPB needs more collaboration activities every year according to the Internationalization Doctoral Study and the quality of resources for this study. UPB must in the future period invest in new applications for building virtual platforms and virtual laboratories. For example (University STU in Trnava, Prof. Radovan Holoubek, Virtual Laboratory for Robotics). I recommended investing in a Doctoral study on English. Translating all Doctoral studies to the English language will be a big step for UPB and UPB will have more foreign students. With foreign students internationalization will be more focused on UPB and give a new dimension in a future.

UPB had excellent doctoral studies and had more than enough professors, laboratories and other resources. UPB is evaluated that fulfilled or necessary indicators to establish Doctoral Study.

## VII. Annexes

The following types of documents shall be attached:

The curriculum for the training program based on advanced university studies in the field of computers and information technologies contains 99 topics, 35 professors, 14 school councils, with 7 professors each, 79 Erasmus universities, 2019-20 52 candidates only in Automation and Computers, 81 doctoral students in 2020 , 20 doctoral students 2021.

The library has 754 books in mathematics, 333 from informatics, 113 from computer networks, 224 from Intelligent systems, 136 from Information technology.



Cuvinte cheie	Număr înregistrări
calculatoare	754
informatica	333
rețele de calculatoare	113
Inteligența artificială	224
tehnologia informației	136

- Cadrele didactice și doctoranzii altor facultati din UPB pot face acelasi lucru folosind adresa: <https://ibm.onthehub.com>



- ISTORIC
- PREZENTARE
- STRUCTURA
- SERVICII
- LUCRARI EDITATE
- ABONAMENTE
- EVENIMENTE
- NOUTATI
- CONTACT
- LEGATURI
- INFORMATII UTILE

ELIBERARE PERMIS DE BIBLIOTECA

VEZI FISA DE INCHIDARE

PROGRAM

**BIBLIOTECA CENTRALA A UNIVERSITATII "POLITEHNICA" DIN BUCURESTI -**

**TRECUT SI PREZENT**



Baze de date stiintifice disponibile prin intermediul Proiectului national ANELIS Plus 2020

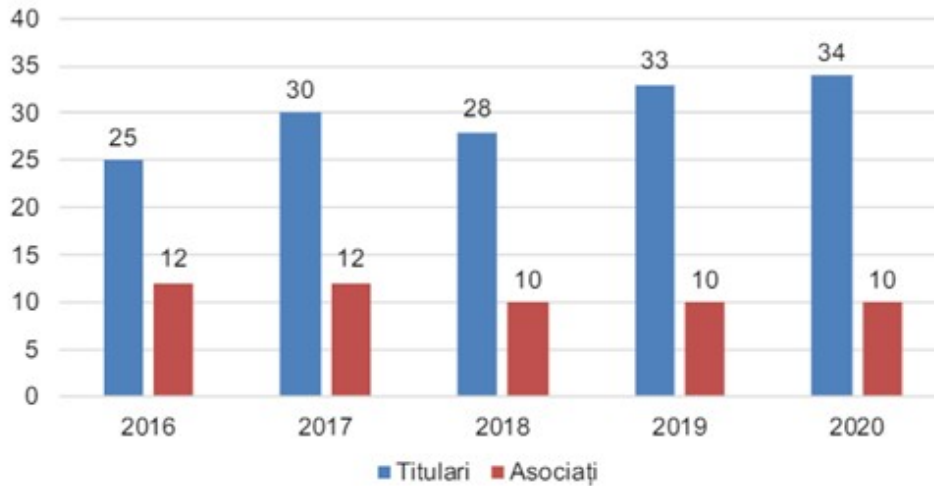
Deponare teze doctorat

 Trial-uri baze de date

Cataloage electronice		Baze de date stiintifice
<b>Catalog WebOPAC</b> Prezentare catalog online	 Catalog colectiv EOLINEST <a href="http://elispn.edu.ro">http://elispn.edu.ro</a> Catalog ROEDOC <a href="http://romdoc.upb.ro">http://romdoc.upb.ro</a>	Baza de date stiintifice Reverse OA     ISI Web of Knowledge™ Acces mobil
	Termeni si conditii de utilizare a revistelor electronice	

1. c) Evoluția numărului de conducători de doctorat

Nr. Conducători	2016	2017	2018	2019	2020
Titulari (Holder)	25	30	28	33	34
Asociați (Associates)	12	12	10	10	10
<b>Total</b>	<b>37</b>	<b>42</b>	<b>38</b>	<b>43</b>	<b>44</b>



Abilitari in SD A&C in perioada 2016-2020

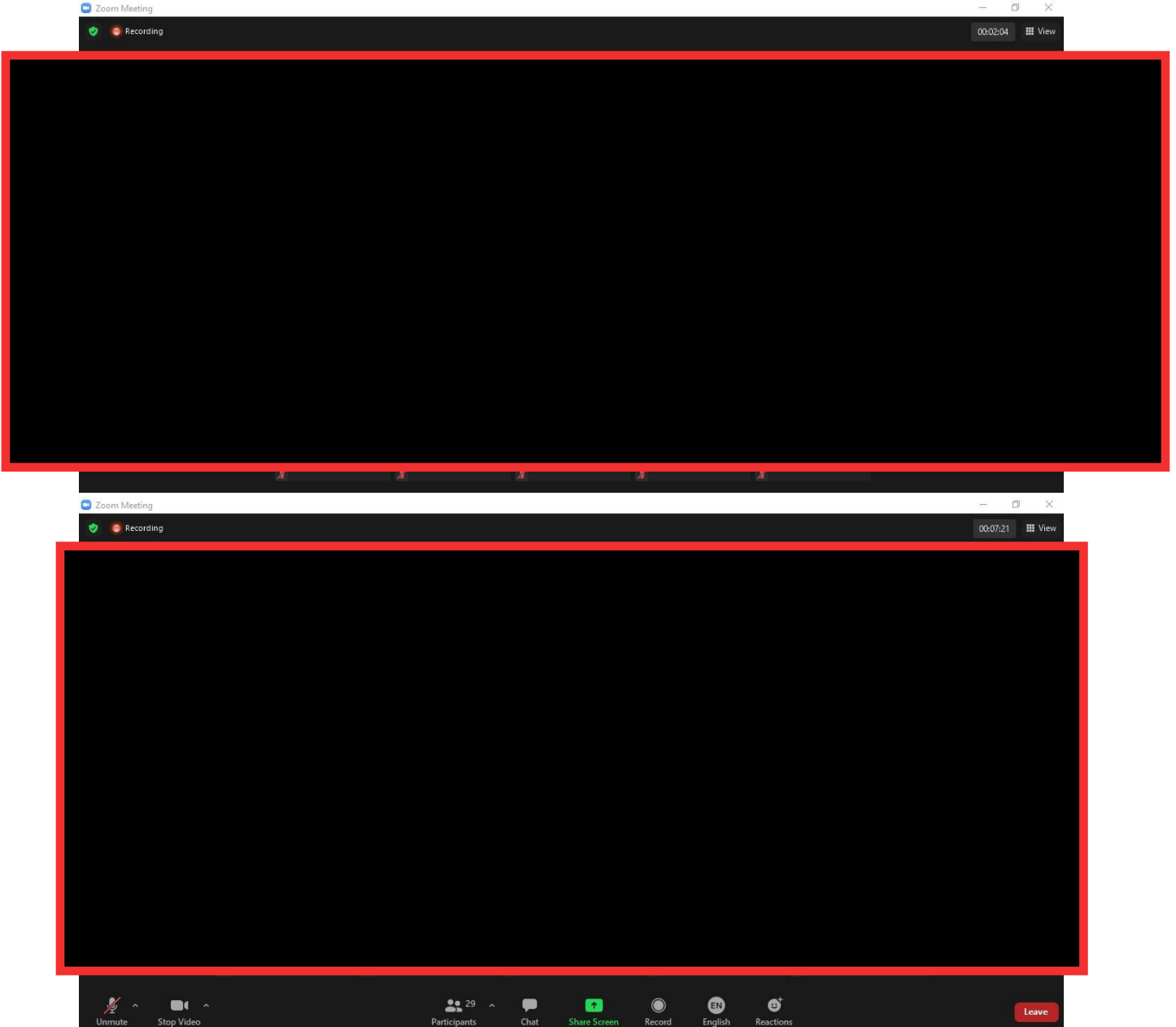
Anul univ.	Abilitari in domeniul CTI	Abilitari in domeniul IS	Total
2016-2017	2	0	2
2017-2018	3	0	3
2018-2019	0	1	1
2019-2020	0	5	5
2020-2021	1	0	1
<b>TOTAL</b>	<b>6</b>	<b>6</b>	<b>12</b>

The CIMR center has a high-performance infrastructure for experimentation and testing of computer- controlled automation solutions, consisting of a flexible robotic cell with 6 industrial robots, 2 machine tools with numerical control and a dual device for feeding parts, provided with artificial vision (<http://www.cimr.pub.ro/>)





Screen shoot from ZOOM meetings.





Date: 5.7.2021

ARACIS International Evaluator  
Prof. Tihomir Latinovici