

## The External Evaluation Report of a Doctoral Study Domain

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

In this chapter, the following shall be summarized:

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

I was assigned with the evaluation of the Doctor Training Program in Electronic Engineering, Telecommunications and Information Technologies at the University of Pitetsi. The evaluation was carried out from the 14th of June 2023 until 16th of June 2023. ARACIS provided access to the Internal Evaluation report of the school. During my visit, I had the opportunity to meet with several stakeholders that are important for the management of the school. The Expert Team (ET) participated in the evaluation, comprises the following members: Professor Dorel Aiordăchioaie (University of Galati), Professor Anastasios Dagiuklas (London South Bank University, UK) and student Mihnea-George MUNTEANU (University of Timisoara).

The Doctoral Schools of the University of Pitești, which is accredited as Organizer Institution of University Doctoral Studies approved by CNATDCU and regulated by IOSUD.

The Interdisciplinary Doctoral School is organized and carries on its activities based on the Regulation of organization within IOSUD University of Pitești, and the leadership being formed by the Director of SDI and the Council of the Interdisciplinary Doctoral School (CSDI). Within the Interdisciplinary Doctoral School, the PhD directors and students act in the following doctoral domains: Materials Engineering, Electronic Engineering, Telecommunications and Informational Technologies, Mechanical Engineering, Mathematics, Informatics, and Biology, these being 6 out of the 10 doctoral domains within UPIT. The Rector informed the ET about the significant changes of the University and its forthcoming merging with the Polytechnic of Bucharest.

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



There are important research activities that demonstrate some of the strengths of the research team. However, there are few weaknesses that have been identified; for those recommendations will be provided.

For the reporting period (2018-2022), there is a sufficient number of PhD supervisors to support the PhD students. However, the number of PhD students follow a declining trend from 2021 and onwards. Such decline is also linked with research outputs from 2021 and onwards.

## II. Methods used

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

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

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

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

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

- classrooms;

- laboratories;

- the institution's library;

- research centers;

- the Career Counselling and Guidance Center;

- lecture halls for students;

- the student residences;

- the student cafeteria;

- sports ground etc.;

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

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

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

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

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

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

- The Council of the Doctoral School, the University Senate, the Board of Directors, the Quality Assessment and Assurance Commission, the Quality Assurance Department, the Ethics Commission (including with the student representatives of these structures);

- the Career Counselling and Guidance Center;

- student organizations;

- secretariats;

- various departments/administrative offices (Social/Student residences-Cafeterias etc.);

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



### III. Analysis of ARACIS's performance indicators

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

*\*general description of domain analysis.*

The analysis is based on Internal Evaluation Report and the meetings that took place with different stakeholders (e.g. University Management team, Head of the Doctoral Training Program, PhD supervisors, mentors, PhD students, PhD graduates and employers). The evaluation report includes basic information regarding historical information about the Faculty, research mission and objectives, quality of the supervision and research output. The internal evaluation report has been provided in English. All the Annexes have been provided in Romanian. However, the responsible team of the doctoral school has provided assistance to understand the structure of the Doctoral school. More specifically, the following clarifications have been provided by the Faculty:

- Evaluation of the course
- Research infrastructure
- Research Outcome
- Secondments in industry
- Employability opportunities

#### **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.*

Both IOSUD and the University of Pitești have implemented efficient functioning mechanisms regarding the organization of doctoral studies, as follows. This organisation is described in the Annex 1.1.1.2; regulation regarding the organization and development of doctoral university studies, Annex 1.1.1.8; regulations for the organization and conduct of doctoral studies in SDI, II.A.1.1.1.2; methodology regarding the election of the members of the Council of the Interdisciplinary Doctoral School, Annex 2.A.1.1.1.3; methodology regarding the organization and development of the process of selection of the management structures of the doctoral schools from IOSUD - University of Pitești and the Annexes. I would not be able to comment on these Annexes, since the language is in Romanian.

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

- (a) *the internal regulations of the Doctoral School;*
- (b) *the Methodology for conducting elections for the position of director of the Council of doctoral school (CSD), as well as elections by the students of their representative in CSD and the evidence of their conduct;*
- (c) *the Methodologies for organizing and conducting doctoral studies (for the admission of doctoral students, for the completion of doctoral studies);*
- (d) *the existence of mechanisms for recognizing the status of a Doctoral advisor and the equivalence of the doctoral degree obtained abroad;*



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

f) the contract for doctoral studies;

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

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

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

After discussing, the structure of the school, with different stakeholders, there is a process to elect the President. The doctoral school has a regulation framework; there is supervisor and there is an internal procedure regarding the training of the doctoral student. However, It seems that there is a lack of formal process of the meetings established between the supervisory team and the PhD students. The doctoral school has recently established a mechanism to monitor the progress of the PhD students. There is no clear mechanism how the PhD degree is recognised abroad.

It must be highlighted that the contract of the PhD students involves teaching, administration and research responsibilities. After discussing with the doctoral students, several students mentioned that they have another job outside the University. This is due to the fact the scholarship received is too low. Additionally, the PhD directors act in the following doctoral domains: Materials Engineering, Electronic Engineering, Telecommunications and Informational Technologies, Mechanical Engineering, Mathematics, Informatics, and Biology. Both Mathematics and Biology are STEM domain and are not linked well with Engineering Topics.

*Recommendations:*

**- Both Mathematics and Biology are STEM disciplines and should be transferred to another domain.**

**-The School should make arrangements for candidates with disabilities.**

**-There is no clear process regarding the replacement of students/academics that leave the University and have been selected as members of the Council.**

**-It is not clear whether there is a gender balance in the Council and its members.**

**-Teaching and Administrative responsibilities should be removed from the PhD students' duties.**

**-The School should create a formal approach to record meetings between the supervisor team and the PhD student.**

**-Use the progress report as a mechanism to withdraw students that are not engaging.**

**The indicator is fulfilled.**

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

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



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

I managed to retrieve the regulation framework of the doctoral school from the English version of the web site: <https://www.upit.ro/en/academia-reorganizata/studii-de-doctorat/scoli-doctorale/interdisciplinarschool>. There is a regulation framework that has been used describing criteria, procedures and standards.

*Recommendations:*

- **There is a need to establish more systematic collaboration between the Doctoral students and the other researchers within the Faculty.**

**The indicator is fulfilled.**

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

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

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

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

During the visit, the ET visited the administration premises of the doctoral school. Apparently, MSExcel spreadsheet has been used to keep track of the PhD students. This is a quite primitive solution. It is not clear why the ICT team has NOT been involved to extend existing IT system used to keep track of undergraduate students. From the discussion, it seems that the academic team has taken over the responsibility to build this temporary solution using MsExcel.

*Recommendations:*

**-Extend existing IT system to keep track of the PhD students.**

**-Extend existing IT system to keep track of the alumni.**

**The indicator is not fulfilled.**

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

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

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The University utilises Turnitin software tool that compares the text from the thesis and manuscripts with texts from external databases (of other users of the application). The software may indicate similarities between the verified text and the texts with which it was compared. Samples have been provided how Turnitin has been used. It seems that the academics have used Turnitin to check both scientific manuscripts submitted to international journals and conferences and theses. Turnitin has NOT been integrated with Moodle; as an effect the academics can use a two phase process to check text similarities.



There are no associated penalties in cases where similarity index is too high either in manuscripts submitted

*Recommendations:*

- The ICT team must integrate Turnitin plugin in the Moodle.**
- Use of anonymised samples of PhD theses to train students.**
- Penalties must be defined in cases where there is a high similarity index either in manuscripts that will be submitted in journal/conferences or theses for review.**

**The indicator is fulfilled.**

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

The Internal Evaluation report provides information about the financial resources are used in an optimal manner.

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

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

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The academic team has provided information about an on-going research project in the area of cyber security. The project is entitled "Modular symmetric cryptosystem for securing traffic in telecommunication networks" (CRYPTONET) and is funded by the Ministry of Education. Currently, there is a PhD student engaged with this project. Annexes 2.A.1.3.1.a Contract list and Annex 2.A.1.3.1.b provide contract information on PhD students' engagement. However, his role is not very clear. It is not clear how research projects are linked with activities in research centres. Both research grants and institutional development grants have been shown. It seems that there is activity to attract research grants and foster innovation. However, few academics have been engaged with research projects and grants.

*Recommendations:*

- Link the research strategy and objectives with the research grants**
- Adopt a strategy where academic engagement in research grant writing and management reaches at least 75%.**

**The indicator is fulfilled.**

**Performance Indicator \*A.1.3.2.** The percentage of doctoral students active at the time of the evaluation, who for at least six months receive additional funding sources besides government funding, through



scholarships awarded by individual persons or by legal entities, or who are financially supported through research or institutional/human resources development grants is not less than 20%.

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

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

In the academic year 2022-2023, in the doctoral domain of Electronic Engineering, Telecommunications and Information Technologies, 10 PhD students are enrolled, of which 4 are beneficiaries of funding from the state budget/Romanian budget. According to the Internal Evaluation report, Annex 2.A.1.3.2 lists the doctoral students who have received or are receiving funding from the state budget for doctoral studies and who have received additional financial support under the conditions indicated by this indicator. The cohort is rather small; the funds are sufficient to support the existing cohort PhD students.

*Recommendations:*

**The indicator is fulfilled.**

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

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

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The funds are mainly allocated to students' participation in conferences. Only a small number of students go on programmes abroad. This is due to the fact that they have a job outside University. There is no good balance between the students in scholarships versus student on self-funding: 32% versus 21%. There is a need for both the academic team and the PhD students to be engaged with this activity (secondments abroad, invite researchers from abroad to visit the doctoral school). This is important to enhance and improve research quality.

*Recommendations:*

**-The Faculty must invest funds to train PhD students to attend conferences, exhibitions, summer schools and utilise open access publication fees in a more systematic manner.**

**-The students must go on secondments to research centres abroad.**

**-There must be a KPI so that at least one dissemination activity is planned for each PhD student within the 3 year periods of study. Ideally, one dissemination activity must be planned at the end of each year.**

**-The supervisory committee could monitor the students to meet these targets.**

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



***The indicator is fulfilled.***

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

The School has demonstrated few good examples regarding research facilities, equipment and infrastructure so that the PhD students can carry their PhD projects.

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

The research is supported by the following Research Centers: CRC&D -Auto (research related to automotive and consists of comprises 3 scientific researchers III, 15 scientific research assistants, an engineer (own staff) and affiliated university teacher), research centre for Modelling and simulation of Processed and systems (It consists of one scientific researcher) and ELECTROMET. The research infrastructure is of high quality to drive research and produce important research results. However, this infrastructure is not linked efficiently with research priorities that are quite fragmented. This is especially evident on research related to medical processing and analysis. As an effect, there is a lack of research strategy in the school regarding these activities. The school must highlight on research activities related to cyber security, embedded H/W and AI workload on edge H/W infrastructure. The school must consider the competitive advantage and set-up activities related to automotive and establish stronger research collaboration with DACIA.

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

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

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

*Recommendations:*

**-The Faculty should adopt a strategy to restructure the research centers with emphasis mainly on cyber security and embedded H/W design.**

**-The Faculty may need to obtain funds so that calibration of equipment is carried out in a systematic manner on frequent basis.**

**-There is a process required within the school regarding the decision making for the purchase of the research infrastructure.**

***The indicator is fulfilled.***

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

*There is sufficient information in the Internal Evaluation Report regarding the human resources. The quality of the human resources is not very clear, as explained in the following sub-criteria. Since this is an important part of the evaluation, it is expected that Annexes must be provided in English.*





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

*There is a large diversity of research activities ranging from cyber security, embedded H/W to biomedical signal processing. The fragmented research activities tend not to provide high-quality research outputs.*

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

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

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

According to the evaluation report, there are five (5) scientific doctoral supervisors affiliated with the School: Prof. dr. eng. LITA Ioan, Assoc. Prof. dr. eng. ANGHELESCU Petre, Prof. dr. eng. TULBURE Adrian-Alexandru, Prof. dr. eng. JURIAN Mariana and Prof. dr. eng. GAVRILLOAIA Gheorghe. The internal evaluation report states that all academics have proven experience to carry out research in the field. However, two of them (Professor JURIAN Mariana and GAVRILLOAIA Gheorghe) do not meet the CNATDCU criteria in terms of publishing research work within the reporting period (2018-2022). Although the Annexes have been provided, only Professor ANGHELESCU Petre' report was easy to understand and evaluate. That is not the case for the other Annexes. I noticed that few academics have used in their CVs their personal email address and not their professional email address provided by the University.

The research team is rather small and two of the academics have been contributing fairly in research outcomes within the reporting period. This is a bit challenging for the sustainability of the doctoral school. Additionally, it is questionable whether these two academics support the work of the Director regarding the research objectives and mission of the doctoral school.

*Recommendations:*

**-Research quality needs to be improved. The doctoral school should be more focused.**

**-The Web profile of the supervisors must provide in different tabs the following information: research area, research students, key publications, and grants. Such information must be provided in both Romanian and English.**

***The indicator is fulfilled.***

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

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

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

There are five (5) academics that have full-time employment with the University. There is sufficient number of academics that can support the PhD students. The workload distribution is not even. This number is not enough to support all research areas that have been identified by the school. However, the

research activities are fragmented; as an effect there is a need for the research to be more focussed to improve research outcome.

*Recommendations:*

**The indicator is fulfilled.**

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

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

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

The Internal Evaluation report provides a short summary of the skills of the academics. More detailed information is provided in Annex A.3.1.2. that it is in Romanian. From the CVs of the academics, it seems that they have the expertise to deliver the planned training. The Faculty provides training and carries out research in different areas within the specific domain. There is no mechanism to check the fact that a PhD student may repeat a course during the Doctoral program. The method of evaluation is not focussed on critical analysis and preparation of the PhD students to write scientific reports. The material for the courses should be mainly scientific papers from high-impact journals and conferences that have been published within the last 5 years; however this is not the case. The evaluation of the curriculum from the first year is not very clear and should be revised.

*Recommendations:*

**-The curriculum requires revision.**

**-English sessions and soft-based skills should be embedded in the curriculum.**

**-Guest lectures should be embedded in the curriculum.**

**The indicator is fulfilled.**

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

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

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

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<sup>3</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.

Table 3.1.4 provides the distribution of doctoral students to the supervisors. There is a sufficient number of academics that supervise the PhD students. The allocation of the PhD students among the supervisors is unbalanced.

Recommendations:

**The indicator is fulfilled.**

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

Doctoral thesis advisors in the domain of Electronic Engineering, Telecommunications and Information Technology have listed or indexed scientific publications in the Web of Science (Annex 2.A.3.2.1.a Relevant scientific publications doctoral supervisors), with relevant significance for the doctoral field. However, not all activities are visible at international level.

**Performance Indicator A.3.2.1.** At least 50% of the doctoral thesis advisors in the evaluated domain have at least 5 Web of Science- or ERIH-indexed publications in magazines of impact, or other achievements of relevant significance for that domain, including international-level contributions that indicate progress in scientific research - development - innovation for the evaluated domain. The aforementioned doctoral thesis advisors enjoy international awareness within the past five years, consisting of: membership on scientific boards of international publications and conferences; membership on boards of international professional associations; guests in conferences or expert groups working abroad, or membership on doctoral defense commissions at universities abroad or co-leading with universities abroad. For Arts and Sports and Physical Education Sciences, doctoral thesis advisors shall prove their international visibility within the past five years by their membership on the boards of professional associations, membership in organizing committees of arts events and international competitions, membership on juries or umpire teams in artistic events or international competitions.

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

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

Three out five academics have research outputs within the reporting period. In WOS. However, there is a large number of research outputs that have been presented in conferences that are organised within Romania. This indication has met the criterion.

Recommendations:

**-The Department needs to adopt strategy so that academic staff whose criteria are below the metric, must be improved.**

**-Enhance research outputs by publishing papers in international venues outside Romania.**

**The indicator is fulfilled.**

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



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

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

After assessing Annex 2.A.3.2.2.a, Annex 2.A.3.2.2.b, Annex 2.A.3.2.2.c and Annex 2.A.3.2.2.d, not all supervisors are research active. There are two academics that do not fulfil the 25% score criteria. However, the indicator has been fulfilled.

Recommendations:

**-The school must provide a strategy that all academics contribute to research output in international conferences and journals.**

**The indicator is fulfilled.**

## **Domain B. EDUCATIONAL EFFECTIVENESS**

This is the section, where several shortcomings have been identified. They are related to attract candidates, graduate and drop rate, quality of the programme,

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

*\*general description of the criterion analysis.*

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

There is a small number of applications/candidates within the reporting period. It seems that there are no appropriate measures to advertise the doctoral school activities outside the University. There is a declining trend of candidates for the doctoral school. Additionally, the graduates from the University seem not to be interested to the doctoral programme.

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

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

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

There are 11 master's degree graduates from other higher education institutions in the country or abroad who have entered the competition for admission to doctoral studies in the last five years. There are places financed from the state budget put up for competition within the doctoral domain of Electronic



engineering, telecommunications and information technologies. As an effect, the requested indicator has been fulfilled.

*Recommendations:*

- Advertise the doctoral programme both internally and externally.**
- Competitive advantage of the Doctoral Program and its link with industrial partner must be highlighted; especially with Dacia.**
- Improve the information of the web site both in English and Romanian.**
- Use of social media to promote research outputs.**
- Use alumni to attract new students.**

**The indicator is fulfilled.**

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

The Internal Evaluation report states that there is an admission policy for accepting candidates to the Programme. Two points have been highlighted:-The admission does not specify whether the candidates must hold MSc degree in the domain. -The performance of the students at both undergraduate and postgraduate studies have not been considered.

The English language skills has not been considered; it is expected that the candidates must submit a research proposal.

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

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

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

There is an admission process regarding the selection of candidates. After discussing with the academics of the doctoral school and students, there is a lack of qualitative assessment of the skills of the candidates. Additionally, the candidates do not have access to high-quality content (papers published in high-impact journals and conferences such as IEEE and ACM) to write their research proposal.

*Recommendations:*

- Quality evaluation of the qualifications must be considered in the selection process.**
- The candidates must have access to high-impact journals to prepare their proposal.**

**The indicator is partially fulfilled.**



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

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

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

*This is an area where the academic team necessitates to put a lot of effort for improvements. Table 1.1.2 illustrates the number of students enrolled each year not only in the doctoral school under evaluation, but also to the disciplines of material, industrial and mechanical engineering and biology. This Table is not linked well with Table 1.1.3 illustrating the PhD graduates. It seems that there is a lack of an efficient process monitoring the progress of the PhD students. There is a lack of withdraw process when there is limited progress and lack of engagement. Additionally, the report states that in the school there are no PhD graduates and no students expelled within the reporting period.*

*Recommendations:*

**-Apply a more systematic monitoring on student's process and apply a withdraw process when there is a lack of engagement.**

**-Students must focus on research and they must not be engaged with administrative and teaching responsibilities.**

**-A capstone model should be adopted engaging PhD with MSc students.**

***The indicator is not 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 behavior in science.*

*The content needs to be revised. I have checked the syllabus of each module. The content is not appropriate for the PhD level. The references include books published more than 10 years ago and research papers that have not been published within the last 5 years. I have taken into consideration the fact that the Library does not provide access to IEEE and ACM Libraries which is the key to access high quality research papers. Additionally, the module Entitled "Statistical Signal Processing and Optimisation" is provided also to the students that they do research in the area of Cyber Security. I suggest replacing this module with something related to Data Mining and machine learning.*

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

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

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<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.



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

Topics such as academic writing, cyber security and ethics are important for all PhD students of the school. However, the module entitled "Statistical Signal Processing" is not appropriate for the Cyber Security doctoral students. The students need to have an additional module related to English. From the discussion and interaction with the students, not all of them were comfortable to speak in English. There is need to improve English speaking fluency.

Recommendations:

- **Revise "Statistical Signal Processing and Optimisation" module offered to Students.**
  - **More research papers must be embedded in the curriculum.**
  - **The Doctoral School must have access to IEEE and ACM Digital Libraries.**
- The indicator is not fulfilled.**

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

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

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

The Doctoral School offers a module entitled "Research Ethics, Scientometry and Academic Writing". This indicator has been fulfilled.

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>.

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

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

Thus, for each module provided in the curriculum, the syllabus describes professional and transversal competences and skills. There is a need of more critical thinking embedded in the syllabus. The academic team should consider the invitation of guest lectures from abroad to provide on-line presentations.

Recommendations:

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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 of 17 March 2017 regarding inscription and registration of higher education qualifications in the National Register of Qualifications in Higher Education (RNCIS) approved by the Order No.3475/2017 with subsequent amendments and additions.



**-More critical thinking is required at the syllabus.**

**-Soft-based skills must be improved.**

**The indicator is partially fulfilled.**

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

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

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

*It seems that the progress of the PhD students is problematic. As highlighted above, the vast majority of PhD students do not manage to progress towards the PhD degree. This is also due to fact that several students have a job outside University. The Annexes indicate that the supervisors meet their PhD students to contribute to theoretical and scientific collaboration. However, there is limited information regarding the meetings, the topics of discussion and action points. This is important for conflict management.*

*Recommendations:*

**-An IT system is required to record the meetings of the PhD student with the supervisory team and the agreed action plans.**

**-The research workload of the PhD students must be revised.**

**-Link the meeting with tangible milestones to monitor the progress.**

**The indicator is partially fulfilled.**

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

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

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

*Currently, there are 10 doctoral students and 12 PhD supervisors. The ratio is 10:12, resulting in 0.83. Therefore, the indicator has been fulfilled.*

*Recommendations:*

**The indicator is fulfilled.**

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

*\*general description of the criterion analysis.*

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



The Internal Evaluation report presents an overview of the results from the PhD Students in terms of presentations, paper published, research project participation, internships and event training.

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

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

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

The Internal Evaluation report presents an overview of the results from the PhD Students in terms of presentations, paper published, research project participation, internship engagement and event training. Annex 2.B.2.1.4.b provide a list of scientific papers of doctoral students & mentors. The number of published works in the reporting period (2018-2022) is rather small. Most of the work has been presented in conferences that have been organised mainly within Romania. The contributions are original but not significant. Most of the papers have been presented in conferences. There is portal in Australia where conferences can be ranked using different criteria: <http://portal.core.edu.au/conf-ranks/?search=&by=title&source=CORE2021&sort=atitle&page=1>. The significance can be measured also by the number of citations. This is a weak point of the School and there is room for improvements.

Recommendations:

**-The Faculty must define a strategy so that the research output quality is improved.**

**The indicator is partially fulfilled.**

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

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

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

In the doctoral domain of Electronic Engineering, Telecommunications and Information Technologies, in the last 5 years, no doctoral student has completed his/her doctoral studies. This is problematic and the School must take actions to improve this. There is large number of students (information can be extracted from Table 1.1.2 and Table 1.1.3) that do not manage to finish their studies within the maximum 7 years window. The monitoring progress need substantial improvements.

Recommendations:

**-Use periodic reports to systematically assess student's performance.**



**The indicator is not fulfilled.**

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

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

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

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

*This is another metric that cannot be measured since the School does not have PhD graduates.*

*Recommendations:*

**The indicator is partially fulfilled.**

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

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

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

*This is another metric that cannot be measured since the School does not have PhD graduates.*

*Recommendations:*

**The indicator is partially fulfilled.**

## **Domain C. QUALITY MANAGEMENT**

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

*The School has an internal quality management system that has been used for the monitoring and performance evaluation of the PhD students.*

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

*The University evaluates and monitors the evolution of all the Doctoral Schools centrally. The University has used the periodic self-evaluation of doctoral study programs, by quantifying their degree of*

quality assurance based on several self-evaluation criteria (e.g. the existence and quality of teaching staff, the content of the educational process, doctoral students, the content and results of scientific research, material basis, scientific, professional and university ethics).

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

- (a) *the scientific work of Doctoral advisors;*
- (b) *the infrastructure and logistics necessary to carry out the research activity;*
- (c) *the procedures and subsequent rules based on which doctoral studies are organized;*
- (d) *the scientific activity of doctoral students;*
- (e) *the training program based on advanced academic studies of doctoral students;*
- (f) *social and academic services (including for participation at different events, publishing papers etc.) and counselling made available to doctoral students.*

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

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

The University evaluates and monitors the evolution of all the Doctoral Schools centrally. More information is provided in the relevant Annexes regarding the logistics, workflow, supervisors' contribution, student's activities and social and academic services. The University must take actions to school where there is a declining number of admitted students and the expected PhD graduate rate is low.

*Recommendations:*

**-Improve the engagement of different stakeholders (e.g. companies, public organisation) on the program design.**

**-A workflow system is required for the conflict management.**

**-It is not clear how the self-evaluations can improve the quality outcome.**

**-Monitoring the number of admitted students in the program and monitor their progress towards graduation.**

***The indicator is partially fulfilled.***

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

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

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

*During the interview with the PhD students, they have suggested that more support is needed on the academic writing. Additionally, the students work in totally different projects and there is a lack of*



*interaction between them, which is important in a research community. Students' needs are captured through a questionnaire that was introduced the last two years of the evaluation period.*

*Recommendations:*

**-More academic support on academic writing is needed.**

**The indicator is fulfilled.**

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

*\*general description of the criterion analysis.*

*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 Doctoral School regulation;*

*(b) the admission regulation;*

*(c) the doctoral studies contract;*

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

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

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

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

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

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

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

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

*The University uses a web link (<https://www.upit.ro/ro/academia-reorganizata/studii-de-doctorat/regulamente-si-legislatie-nationala-iosud>) for the doctoral students. The portal includes information such as the Regulation of the Doctoral School, the doctoral study agreement, Institutional Regulation and the standards associated with the thesis. The Faculty has provided all the requested information. There is solid workflow system regarding the management of the training*

*Recommendations:*

**-The Academics and the Doctoral students must use their corporate emails for all University activities and interactions. This important to maintain the GDPR policy.**

**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.

*The resources that are available to the PhD students require improvements. The Library provides access to Springer publisher only. The students and the supervisors do not have access to the IEEE and ACM Digital Libraries. This is quite important in order to use high quality references for the research work.*

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

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

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

*The Students need access to high-quality research papers. The library provides access to electronic libraries through ANELIS+ project. However, there is no available access to both IEEE and ACM Digital Libraries that are important for the doctoral school. Most of the textbooks are appropriate mainly for undergraduate and MSc courses.*

Recommendations:

**-Access to IEEE and ACM Digital libraries must be provided.**

**The indicator is partially 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.

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

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

*Each student has access to the Turnitin to check similarity check. The Turnitin contract has been provided in Annex 2.A.1.2.2.5. It is very positive that plagiarism/academic misconduct is managed centrally. It is not clear what penalty is applied and there is no evidence regarding use cases that have been flagged.*

Recommendations:

**- Make clear the penalties applied to plagiarism.**

**The indicator is fulfilled.**

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

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

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

*As described in Section B, the students have access to state-of-the-art labs that could be used for the research experimentation; especially in the areas of embedded H/W and cyber security. The access of*

Doctoral students to these facilities is well-defined. In these laboratories, Doctoral students are assisted by mentors, who facilitate the operation and management of various equipment. Limited information can be retrieved from the URL provided in the Internal Evaluation report.

Recommendations:

**The indicator is fulfilled.**

### Criterion C.3. Internationalization

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

The doctoral domain in Electronic Engineering, Telecommunications and Information Technologies has been established, through the ERASMUS Office (<https://www.upit.ro/ro/international>), mobility agreements with foreign universities. The detailed list of these agreements is provided in Annex 2.C.3.1.1.a International collaboration agreements. It is not clear why doctoral mobility agreements is applied only with few of the collaborative universities. Students participate in events that are supported by IEEE.

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

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

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

Nine (9) doctoral students from the domain have participated in international scientific conferences as shown in Annex 2.B.2.1.4.b. Although, the vast majority of these events are supported by IEEE, they are held mainly within Romania. As an effect, the exposure of students to events that take place outside Romania is rather limited.

Recommendations:

**-There is a need for doctoral students to participate in events that are held outside Romania.**

**The indicator is partially fulfilled.**

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

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

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



Annex 2.C.3.1.2 provides information about two students that defended their PhD thesis abroad. However, this took place outside the required reporting period. Limited information is about the invitation of leading experts to deliver lectures to doctoral students within the reporting period.

*Recommendations:*

- Invite leading experts to deliver lectures in a systematic manner.
  - Sign agreements so that doctoral students can defend their thesis in co-tutelage internationally.
- The indicator is partially fulfilled.**

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

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

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

Within the reporting period, there are no experts from abroad participating in the PhD supervisory committees. Besides ERASMUS agreements, the school must participate in exhibitions to attract more doctoral students, outside Pitetsi. There is a need to provide a strategy to establish this collaboration in a more systematic manner. There is no defined strategy to attract international students. The school will need to advertise PhD positions in English.

*Recommendations:*

- Define a strategy to attract international students.
- Invite international experts to participate to the doctoral supervisory committees in a systematic manner.

**The indicator is partially fulfilled.**

#### IV. SWOT Analysis

<b><u>Strengths:</u></b>	<b><u>Weaknesses:</u></b>
<ul style="list-style-type: none"> <li>- Important research activities in the areas of Cyber Security and Embedded H/W design.</li> <li>-Established collaboration with local automotive industry (DACIA)</li> </ul>	<ul style="list-style-type: none"> <li>- The research activities are fragmented.</li> <li>-Research facilities have been distributed in two different locations.</li> <li>-Too many research centers.</li> <li>-Lack of systematic collaboration with national industries and public stakeholders.</li> <li>-Lack of a culture to establish collaboration among the PhD students.</li> <li>-Lack of clear strategy to attract foreign PhD students.</li> </ul>

	-Few academics do not meet the CNATDCU criteria.
<p><b><u>Opportunities:</u></b></p> <p>- explore collaboration with the established doctoral school at the Polytechnic of Bucharest.</p>	<p><b><u>Threats:</u></b></p> <p>- declining number of candidates interested to pursue PhD studies.</p> <p>- The level financial support may not be attractive for the talented graduates who prefer to pursue PhD studies abroad.</p> <p>-The overlapping research activities with Doctoral School from other Universities pose questions regarding sustainability.</p>

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

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
1.	PI	<p><b>A.1.1.1.</b> The existence of specific regulations and their application at the level of the Doctoral School of the respective university doctoral study domain:</p> <p>a) the internal regulations of the Doctoral School;</p> <p>b) the Methodology for conducting elections for the position of director of the Council of doctoral school (CSD), as well as elections by the students of their representative in CSD and the evidence of their conduct;</p> <p>c) the Methodologies for organizing and conducting doctoral studies (for the admission of doctoral students, for the completion of doctoral studies);</p> <p>d) the existence of mechanisms for recognizing the status of a Doctoral advisor and the equivalence of the doctoral degree obtained abroad;</p> <p>e) functional management structures (Council of the doctoral school), giving as well proof 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 regarding the training for doctoral study programs based on advanced academic studies.</p>	Fulfilled	<p>- Both Mathematics and Biology are STEM disciplines and should be transferred to another domain.</p> <p>-The School should make arrangements for candidates with disabilities.</p> <p>-There is no clear process regarding the replacement of students/academics that leave the University and have been selected as members of the Council.</p> <p>-It is not clear whether there is a gender balance in the Council and its members.</p> <p>- Teaching and Administrative responsibilities should be removed from the students' duties.</p> <p>- The School should create a formal approach to record meetings between the supervisor team and the PhD student.</p> <p>-Use the progress report as a mechanism to withdraw students that are not engaging.</p>



No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
2.	PI	<b>A.1.1.2.</b> 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.	Fulfilled	- There is a need to establish more systematic collaboration between the Doctoral students and the other researchers within the Faculty.
3.	PI	<b>A.1.2.1.</b> The existence and effectiveness of an appropriate IT system to keep track of doctoral students and their academic background.	NOT fulfilled	-Extend existing IT system to keep track of the PhD students -Extend existing IT system to keep track of the alumni.
4.	PI	<b>A.1.2.2.</b> The existence and use of an appropriate software program and evidence of its use to verify the percentage of similarity in all doctoral theses.	Fulfilled	-The ICT must integrate Turnitin plugin in the Moodle. -Use of anonymised samples of PhD theses to train students. -Penalties must be defined in cases where there is a high similarity index either in manuscripts that will be submitted in journal/conferences or theses for review.
5.	IP	<b>A.1.3.1.</b> Existence of at least one research or institutional / human resources development grant under implementation at the time of submission of the internal evaluation file, per doctoral study domain under evaluation, or existence of at least 2 research or institutional development / human resources grant for the doctoral study domain, obtained by doctoral thesis advisors operating in the evaluated domain within the past 5 years. The grants address relevant themes for the respective domain and, as a rule, are engaging doctoral students.	Fulfilled	-Link the research strategy and objectives with the research grants. -Adopt a strategy where academic engagement in research grant writing and management reaches at least 75%.
6.	PI *	<b>A.1.3.2.</b> The percentage of doctoral students active at the time of the evaluation, who for at least six months receive additional funding sources besides government funding, through scholarships awarded by individual persons or by legal entities, or who are financially supported through research or institutional / human resources development grants is not less than 20%.	Fulfilled	N/A
7.	PI *	<b>A.1.3.3.</b> At least 10% of the total amount of doctoral grants obtained by the university through institutional contracts and of tuition	Fulfilled	-The Faculty must invest funds to train PhD students to attend conferences, exhibitions, summer schools and utilise

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
		fees collected from the doctoral students enrolled in the paid tuition system is used to reimburse professional training expenses of doctoral students (attending conferences, summer schools, training, programs abroad, publication of specialty papers or other specific forms of dissemination etc.).		<p>open access publication fees in a more systematic manner.</p> <ul style="list-style-type: none"> <li>-The students must go on secondments to research centres abroad.</li> <li>-There must be a KPI so that at least one dissemination activity is planned for each PhD student within the 3 year periods of study. Ideally, one dissemination activity must be planned at the end of each year.</li> <li>-The supervisory committee could monitor the students to meet these targets.</li> </ul>
8.	CPI	A.2.1.1. The venues and the material equipment available to the doctoral school enable the research activities in the evaluated domain to be carried out, in line with the assumed mission and objectives (computers, specific software, equipment, laboratory equipment, library, access to international databases etc.). The research infrastructure and the provision of research services are presented to the public through a specific platform. The research infrastructure described above, which was purchased and developed within the past 5 years will be presented distinctly	Fulfilled	<ul style="list-style-type: none"> <li>-The Faculty should adopt a strategy to restructure the research centers with emphasis mainly on cyber security and embedded H/W design.</li> <li>-The Faculty may need to obtain funds so that calibration of equipment is carried out in a systematic manner on frequent basis.</li> <li>-There is a process required within the school regarding the decision making for the purchase of the research infrastructure.</li> </ul>
9.	CPI	A.3.1.1. Minimum three doctoral thesis advisors within that doctoral domain, and at least 50% of them (but no less than three) meet the minimum standards of the National Council for Attestation of University Degrees, Diplomas and Certificates (CNATDCU) in force at the time when the evaluation is carried out, which standards are required and mandatory for obtaining the enabling certification.	Fulfilled	<ul style="list-style-type: none"> <li>-Research quality needs to be improved. The doctoral school should be more focused.</li> <li>-The Web profile of the supervisors must provide in different tabs the following information: research area, research students, key publications, and grants. Such information must be provided in both Romanian and English.</li> </ul>
10.	PI *	A.3.1.2. At least 50% of all doctoral advisors have a full-time employment contract for an indefinite period with the IOSUD.	Fulfilled	N/A
11.	PI	A.3.1.3. The study subjects in the education program based on advanced higher education studies pertaining to the doctoral domain are taught by teaching staff or researchers who are doctoral thesis advisors / certified doctoral thesis advisors, professors / CS I or lecturer /	Fulfilled	<ul style="list-style-type: none"> <li>-The curriculum requires revision.</li> <li>-English sessions and soft-based skills should be embedded in the curriculum.</li> <li>-Guest lectures should be embedded in the curriculum.</li> </ul>

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
		CS II, with proved expertise in the field of the study subjects they teach, or other specialists in the field who meet the standards established by the institution in relation with the aforementioned teaching and research functions, as provided by the law.		
12.	PI *	<b>A.3.1.4.</b> The percentage of doctoral thesis advisors who concomitantly coordinate more than 8 doctoral students, but no more than 12, who are themselves studying in doctoral programs does not exceed 20%.	Fulfilled	N/A
13.	CPI	<b>A.3.2.1.</b> At least 50% of the doctoral thesis advisors in the evaluated domain have at least 5 Web of Science- or ERIH-indexed publications in magazines of impact, or other achievements of relevant significance for that domain, including international-level contributions that indicate progress in scientific research - development - innovation for the evaluated domain. The aforementioned doctoral thesis advisors enjoy international awareness within the past five years, consisting of: membership on scientific boards of international publications and conferences; membership on boards of international professional associations; guests in conferences or expert groups working abroad, or membership on doctoral defense commissions at universities abroad or co-leading with universities abroad. For Arts and Sports and Physical Education Sciences, doctoral thesis advisors shall prove their international visibility within the past five years by their membership on the boards of professional associations, membership in organizing committees of arts events and international competitions, membership on juries or umpire teams in artistic events or international competitions.	Fulfilled	<p><b>-The Department needs to adopt strategy so that academic staff whose criteria are below the metric, must be improved.</b></p> <p><b>-Enhance research outputs by publishing papers in international venues outside Romania.</b></p>
14.	PI *	<b>A.3.2.2.</b> At least 50% of the doctoral thesis advisors in a specific doctoral study domain continue to be active in their scientific field, and acquire at least 25% of the score requested by the minimal CNATDCU standards in force at the time of the evaluation, which are required and mandatory	Fulfilled	<b>-The school must provide a strategy that all academics contribute to research output in international conferences and journals.</b>

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
		for acquiring their enabling certificate, based on their scientific results within the past five years		
15.	PI *	<b>B.1.1.1.</b> The ratio between the number of graduates of masters' programs of other higher education institutions, national or foreign, who have enrolled for the doctoral admission contest within the past five years and the number of seats funded by the state budget, put out through contest within the doctoral domain is at least 0.2 or the ratio between the number of candidates within the past five years and the number of seats funded by the state budget put out through contest within the doctoral studies domain is at least 1,2.	Fulfilled	<ul style="list-style-type: none"> <li>-Advertise the doctoral programme both internally and externally.</li> <li>-Competitive advantage of the Doctoral Program and its link with industrial partner must be highlighted; especially with Dacia.</li> <li>-Improve the information of the web site both in English and Romanian.</li> <li>-Use of social media to promote research outputs.</li> <li>-Use alumni to attract new students.</li> </ul>
16.	PI *	<b>B.1.2.1.</b> 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.	Partial Fulfilled	<ul style="list-style-type: none"> <li>-Quality evaluation of the qualifications must be considered in the selection process.</li> <li>-The candidates must have access to high-impact journals to prepare their proposal.</li> </ul>
17.	PI	<b>B.1.2.2.</b> The expelling rate, including renouncement / dropping out of doctoral students 3, respectively 4, years after admission does not exceed 30%.	Not Fulfilled	<ul style="list-style-type: none"> <li>-Apply a more systematic monitoring on student's process and apply a withdraw process when there is a lack of engagement.</li> <li>-Students must focus on research and they must not be engaged with administrative and teaching responsibilities.</li> <li>-A capstone model should be adopted engaging PhD with MSc students.</li> </ul>
18.	PI	<b>B.2.1.1.</b> 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.	Not Fulfilled	<ul style="list-style-type: none"> <li>-Revise "Statistical Signal Processing and Optimisation" module offered to Students.</li> <li>-More research papers must be embedded in the curriculum.</li> <li>-The Doctoral School must get access to IEEE and ACM Digital Libraries.</li> </ul>
19.	PI	<b>B.2.1.2.</b> 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.	Fulfilled	N/A

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
20.	PI	<b>B.2.1.3.</b> 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.	<b>Partial Fulfilled</b>	-More critical thinking is required at the syllabus of the modules. -Soft-based skills must be improved.
21.	PI	<b>B.2.1.4.</b> All along the duration of the doctoral training, doctoral students in the domain receive counselling/guidance from functional guidance commissions, which is reflected in written guidance and feedback or regular meeting.	<b>Partial Fulfilled</b>	-An IT system is required to record the meetings of the PhD student with the supervisory team and the agreed action plans. -The research workload of the PhD students must be revised. -Link the meeting with tangible milestones to monitor the progress.
22.	CPI	<b>B.2.1.5.</b> For a doctoral study domain, the ratio between the number of doctoral students and the number of teaching staff/researchers providing doctoral guidance must not exceed 3:1.	<b>Fulfilled</b>	N/A
23.	CPI	<b>B.3.1.1.</b> For the evaluated domain, the evaluation commission will be provided with at least one paper or some other relevant contribution per doctoral student who has obtained a doctor's title within the past 5 years. From this list, the members of the evaluation commission shall randomly select 5 such papers / relevant contributions per doctoral study domain for review. At least 3 selected papers must contain significant original contributions in the respective domain	<b>Partial Fulfilled</b>	The Faculty must define a strategy so that the research output quality is improved.
24.	PI *	<b>B.3.1.2.</b> The ratio between the number of presentations of doctoral students who completed their doctoral studies within the evaluated period (past 5 years), including posters, exhibitions made at prestigious international events (organized in the country or abroad) and the number of doctoral students who have completed their doctoral studies within the evaluated period (past 5 years) is at least 1.	<b>Not fulfilled</b>	-Use periodic report to systematically assess student's performance.
25.	PI *	<b>B.3.2.1.</b> The number of doctoral theses allocated to one specialist coming from a higher education institution, other than the	<b>Partial Fulfilled</b>	-Use periodic report to systematically assess student's performance.

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
		evaluated IOSUD should not exceed two (2) in a year for the theses coordinated by the same doctoral thesis advisor.		
26.	PI *	<b>B.3.2.2.</b> The ratio between the doctoral theses allocated to one scientific specialist coming from a higher education institution, other than the institution where the defense on the doctoral thesis is organized, and the number of doctoral theses presented in the same doctoral study domain in the doctoral school should not exceed 0.3, considering the past five years. Only those doctoral study domains in which minimum ten doctoral theses have been presented within the past five years should be analyzed.	<b>Partial Fulfilled</b>	<b>-Use periodic reports to systematically assess student's performance.</b>
27.	PI	<b>C.1.1.1.</b> The Doctoral school in the respective university study domain shall demonstrate the continuous development of the evaluation process and its internal quality assurance following a procedure developed and applied at the level of the IOSUD, the following assessed criteria being mandatory: a) the scientific work of Doctoral advisors; b) the infrastructure and logistics necessary to carry out the research activity; c) the procedures and subsequent rules based on which doctoral studies are organized; d) the scientific activity of doctoral students; e) the training program based on advanced academic studies of doctoral students; f) social and academic services (including for participation at different events, publishing papers etc.) and counselling made available to doctoral students.	<b>Partial Fulfilled</b>	<b>-Improve the engagement of different stakeholders (e.g companies, public organisation) on the program design is required. -A workflow system is required for the conflict management. -It is not clear how the self-evaluations can improve the quality outcome. -Monitoring the number of admitted students in the program and monitor their progress towards graduation.</b>
28.	PI *	<b>C.1.1.2.</b> Mechanisms are implemented during the stage of the doctoral study program to enable feedback from doctoral students allowing to identify their needs, as well as their overall level of satisfaction with the doctoral study program in order to ensure continuous improvement of the academic and administrative processes. Following the analysis of the results, there is evidence that an action plan was drafted and implemented.	<b>Fulfilled</b>	<b>-More academic support on academic writing is needed.</b>

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
29.	CPI	<p><b>C.2.1.1.</b> 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 Doctoral School regulation;</li> <li>b) the admission regulation;</li> <li>c) the doctoral studies contract;</li> <li>d) the study completion regulation including the procedure for the public presentation of the thesis;</li> <li>e) the content of training program based on advanced academic studies;</li> <li>f) the academic and scientific profile, thematic areas/research themes of the Doctoral advisors within the domain, as well as their institutional contact data;</li> <li>g) the list of doctoral students within the domain with necessary information (year of registration; advisor);</li> <li>h) information on the standards for developing the doctoral thesis;</li> <li>i) links to the doctoral theses' summaries to be publicly presented and the date, time, place where they will be presented; this information will be communicated at least twenty days before the presentation.</li> </ul>	Fulfilled	<p><b>-The Academics and the Doctoral students must use their corporate emails for all University activities and interactions. This important to maintain the GDPR policy.</b></p>
30.	PI	<p><b>C.2.2.1.</b> All doctoral students have free access to one platform providing academic databases relevant to the doctoral studies domain of their thesis.</p>	Partial Fulfilled	<p><b>-Access to IEEE and ACM Digital libraries must be provided.</b></p>
31.	PI	<p><b>C.2.2.2.</b> 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.</p>	Fulfilled	<p><b>- Make clear the penalties applied to plagiarism.</b></p>
32.	PI	<p><b>C.2.2.3.</b> 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.</p>	Fulfilled	N/A
33.	PI *	<p><b>C.3.1.1.</b> IOSUD, for every evaluated domain, has concluded mobility agreements with universities abroad, with research institutes, with companies working in the field of study, aimed at the mobility of doctoral students and</p>	Partial Fulfilled	<p><b>-There is a need for doctoral students to participate in events that are held outside Romania.</b></p>

No.	Type of indicator (PI, PI *, CPI)	Performance indicator	Judgment	Recommendations
		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.		
34.	PI	<b>C.3.1.2.</b> In the evaluated doctoral study domain, support is granted, including financial support, to the organization of doctoral studies in international co-tutelage or invitation of leading experts to deliver courses/lectures for doctoral students.	<b>Partial Fulfilled</b>	<ul style="list-style-type: none"> <li>-Invite leading experts to deliver lectures in a systematic manner.</li> <li>-Sign agreements so that doctoral students can defend their thesis in co-tutelage internationally.</li> </ul>
35.	PI	<b>C.3.1.3.</b> The internationalization of activities carried out during the doctoral studies is supported by IOSUD through concrete measures (e.g., by participating in educational fairs to attract international doctoral students; by including international experts in guidance committees or doctoral committees etc.).	<b>Partial Fulfilled</b>	<ul style="list-style-type: none"> <li>-Define a strategy to attract international students.</li> <li>-Invite international experts to participate to the doctoral supervisory committees in a systematic manner.</li> </ul>

*The recommendations contained in the report shall be resumed in the indicators' analysis. Other general recommendations may be made that do not fit within a particular indicator.*

*VERY IMPORTANT!!! – Each identified weakness must be correlated with at least one recommendation to improve the situation!*

## **VI. Conclusions and general recommendations**

*The doctoral school in Electronic Engineering, Telecommunications and Information Technologies School will face many challenges after University's merging plan with the Polytechnic of Bucharest. It must be highlighted school's strength in research activities related to cyber security and embedded H/W design. However, few weaknesses have been identified; the doctoral school shows a declining trend to attract new students; the research activities look fragmented; there is a need to improve the monitoring process of the students; the quality of the modules needs improvement; there is a better improvement of the international exposure of the PhD students to research carried outside Romania. For all the reasons highlighted above, I recommend '**limited accreditation**' is provided to the doctoral school.*





## VII. Annexes

*The following types of documents shall be attached:*

- *The detailed schedule of the evaluation visit – MANDATORY.*
- *The survey questionnaire applied to doctoral students or academic staff in the doctoral study domain under review, the results - optional (e.g., in graphic form) and their interpretation - if applicable.*
- *Scanned documents – any document requested from the IOSUD during the evaluation visit and received, which is not found in the internal evaluation file received before the visit and referred to in the report.*
- *Pictures – if relevant issues are raised regarding the condition of the student residences, cafeterias, premises for teaching and learning activities, library etc.*
- *Screenshots/Print screens of the Doctoral School/IOSUD website proving specific claims in the report, accompanied by the date when they were accessed and saved.*
- *Any other documents relevant to the evaluation process referred to in the report.*

*Professor Anastasios Dagiuklas*

*05-07-2023*