ROMANIAN AGENCY FOR QUALITY ASSURANCE IN HIGHER EDUCATION
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Annex No. 3

The External Evaluation Report of a Doctoral Study Domain

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I. Introduction[1]

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

University of Pitesti (UPIT) organizes doctoral studies within the Institution Organizing Doctoral Studies – University of Pitesti (IOSUD-UPIT).

This periodic external evaluation report was carried out for the evaluation of the Electronic Engineering, Telecommunications and Informational Technologies doctoral programme of IOSUD University of Pitesti (UPIT).

Type of evaluation: periodic external evaluation
Evaluation visit period: 22 November - 26 November 2021.
Composition of the expert evaluation committee:
1. Prof. univ. dr. AIORDĂCHIOAIE Dorel - Expert evaluator RNE, Universitatea "Dunărea de Jos" Galați, Romania
2. Prof. univ. dr. eng. Gabor Kiss - international expert, Obuda University, Budapest, Hungary
3. Vătău Vlad - student doctorand, Universitatea Politehnica Timișoara, România.

Due to the restrictions of the pandemic crisis, the evaluation was mainly conducted online. Meetings were organized through the platform Zoom in Romanian but with a simultaneous translator service.

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

Organization and progress of the university doctoral studies in the Doctoral Schools of the University of Pitești, which is accredited as Organizer Institution of University Doctoral Studies by the approving of CNATDCU in 22.07.1997 – address of the Ministry of Instruction number SS/MT/3 and Order of the Minister of National Education number 3012/.05.01.1999, is realized on the strength of Law 1/2011 – The Law of National Education, Government Decision number 681/03.08.2011 respecting the Code of the university doctoral studies with subsequent modifications and completions, the Cart of the University of Pitești (Annex I.1.1.1), and the Regulation about the organization and the progress of the university doctoral studies within IOSUD University of Pitești (Annex I.1.1.2).

By the Address of the Ministry of Instruction number 11128/23.07.1997 (Anexa I.1.1.3), University of Pitești has received the right to organize matriculation at doctoral studies in the scientific branch named TECHNICS, at the specializations Technical Mechanics and Mechanical Vibrations, Technology of Machines' Construction, Automobiles and Tractors. Later, one granted designation of I.O.D. and I.O.S.U.D., respectively, as follows: 1999 - I.O.D. in the fundamental doctoral domain Engineering Sciences (Mechanical Engineering, Industrial Engineering, and Automotive Engineering), 2000 - I.O.D. in the domains Science and Engineering of Materials, Electronic Engineering and Telecommunications, Mathematics and Informatics, 2005 - I.O.D. in the domain Biology.

The doctoral schools within UPIT are confirmed to be parts of IOSUD - UPIT, by OMENCS number 5382/2016 from 29.09.2016 concerning the functioning of the doctoral schools in the academic year 2016-2017 (Annex I.1.1.4). During the academic year 2020-2021 one performed the reorganization of the doctoral schools within UPIT, by the Decision of the Senate of UPIT, 32/29.03.2021 (Annex I.1.1.5) the doctoral schools of Biology, Mathematics, Informatics and Mechanical Engineering being merged in the Interdisciplinary Doctoral School.

The Interdisciplinary Doctoral School is organized and carries on its activities based on the Regulation of organization and operation of the university doctoral studies within the Interdisciplinary Doctoral School within IOSUD University of Piteşti (Annex I.1.1.6), 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 of theses and the PhD students acts in the following doctoral domains: Materials Engineering, **Electronic Engineering, Telecommunications and Informational Technologies**, Industrial Engineering, Mechanical Engineering, Mathematics, Informatics, and Biology, these being 7 out of the 10 doctoral domains within UPIT.

Currently, the doctoral field of Electronic Engineering, Telecommunications and Informational Technologies has 5 supervisors:
1. Prof. dr. eng. JURIAN Mariana (title acquired in 2000);
2. Prof. dr.eng. GAVRILOAIA Gheorghe (qualification acquired in 2001);
3. Prof. Dr. Eng., LITA Ioan (qualification acquired in 2017);
4. Prof. dr. eng. ANGHELESCU Petre (qualification acquired in 2018);
5. Prof. dr. eng., TULBURE Adrian Alexandru (habilitation acquired in 2018).

Also, at the present moment, at the Interdisciplinary Doctoral School, there are 48 PhD students during the period of the university doctoral studies, whereof 7 (4 in national joint supervision) – in the field of Electronic Engineering, Telecommunications, and Informational Technologies.

In the evaluated period (2016 - 2020), in the PhD field Electronic Engineering, Telecommunications and Information Technologies, no PhD student defended his/her PhD thesis

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.

During the evaluation, the self- assessment report and provided annexes were used as the main elements for the evaluation. This information was complemented with additional documentation, such as the presentations displayed during the online meetings and the physical visit to the educational and research infrastructure.

The online meetings proceeded as scheduled with the different stakeholders: representatives of the institution and of the Council for Academic Doctoral Studies (CSUD), responsible of doctoral domain

and the team who drafted the internal evaluation report, doctoral coordinators, PhD students, members of the Ethics Commission, members of the Commission for Quality Evaluation and Assurance, the Directors and persons in charge of the research centers/laboratories, Doctoral Studies Council, employers of doctoral graduates and graduates. The meetings were moderated by the evaluation team, and attendants answered to the question raised by the members of the evaluation panel. In general, all the meeting were satisfactorily carried out and the discussion with attendants helped to clarify the different issues raised by the evaluation members.

III. Analysis of ARACIS's performance indicators

Domain A. INSTITUTIONAL CAPACITY

The doctoral school has mostly proven to adopt the institutional framework required by legal regulations to conduct the doctoral studies. The research infrastructure is adequate to support students and supervisors and the quality of human resources is also good, but some indicator are partially fulfilled or unfulfilled.

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.

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.
The themes of the doctoral study programmes are established through direct discussions and consultations with the members of the Doctoral School Council, taking into account the Internal Research-Development-Innovation Plan. The doctoral student proposes the topic together with the scientific supervisor, the Doctoral School Council analyses it and, together with the scientific supervisor, finalises the topic to be included in the study contract. The advanced training programme and the structure of the

associated scientific research programme are proposed by the scientific supervisor and the doctoral student and approved by the Doctoral School Council. There is no procedure at IOSUD level.

Recommendations: Develop and approve appropriate procedures.

The indicator is partially 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 includes procedures for affiliation of new Doctoral supervisors, for the replacement of a Doctoral supervisor of a Doctoral student and conflict mediation, for the conditions under which the doctoral programme may be discontinued, for the detection of possible fraud in the academic and research activities and for ensuring access to research resources. The decision-making content of the training program and the attendance obligations of students are also covered by the internal regulations.

Documentation related to the IOSUD Regulation and the Regulation of the Doctoral School have been provided as evidence of the previous procedures.

There are no specific recommendations.

The indicator is fulfilled.

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

The IT system is adequate to keep record and analyse the evolution of doctoral students. Information is easily accessible and facilitates the guidance of students. Yet, the information at the website should be also available in English. Accessibility to anti- plagiarism is also guaranteed.

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.

The University of Pitesti has an adequate IT system for the registration of PhD students and their academic career. The software allows:

- the record of doctoral students by year of study;
- the composition of the mentoring team for each doctoral student;
- the doctoral student's advanced training programme (study subjects, scientific reports, etc.)
- planning of activities in time (exams, reports, etc.);
- management of situations where doctoral studies are interrupted.

An extract from this IT system in Annex II.A.1.2.1.1.

Recommendation: Implementation of a computerised record-keeping system (superior to Excel).

The indicator is fulfilled.

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

The anti-plagiarism system sistemantiplagiat.ro is used. Until 2020, the SEMPLAG programme was used to check the percentage of similarity in doctoral theses. Evidence of use in doctoral school:

Annex II.A.1.2.2.1 ReportSemPlag Dragomir Ionut and Annex II.A.1.2.2.2 ReportSemplag Ahmed Omar. For the PhD field Electronic Engineering, Telecommunications and Information Technology, the maximum limits of similarity coefficients and citations in the report generated by the anti-plagiarism program are: similarity coefficient 1 (percentage of the text with all similar sentences found by the system in other documents - relative similarity) = 10% and similarity coefficient 2 (percentage of the text with similar fragments exceeding 25 words - absolute similarity or identity) = 5% ((Annex II.A.1 .2.2.3, (Annex II.A.1.2.2.4).

During the meetings with supervisors and PhD students, it was confirmed the availability of anti-plagiarism software.

There are no specific recommendations.

The indicator is fulfilled.

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

Financial resources are mostly optimally used. Research projects and grant headed by the PhD advisors provide partly additional funding for scholarships and for supporting students' expenses associated to their training program.

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.*

Doctoral supervisors are not directors or programme managers.

Doctoral candidates are involved in research contracts. Extract personnel list - student Stanica George Cosmin_PCCDI BIOHORTINOV.pdf and Extract personnel list - student Coman Daniela Andreea_PCCDI SENSIS.pdf. (15 PhD students in term enrolled in 2020-2021.)

Recommendations: Increase the number of grant applications proposed/obtained by PhD supervisors and the number of PhD students involved in research grants.

The indicator is partially 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%.*

Total number of enrolled students 15.

For the percentage of 20 you need evidence for 0.2 * 15 = 3 students.

Evidence:

A.1.3.2.d (Coman Daniela Andreea) employed on the SENSIS project.

Szabo Ioan has an annual scholarship from Dailmer Sebes. (AS-1-Dovada Ioan scholarship).

Pintea Bogdan George has a scholarship .... granted by Microsoft Romania (AS-2 -Dovada bursa Pintea)

There are no specific recommendations.
The indicator is fulfilled.

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

At IOSUD-UPIT level, the use of doctoral funds benefits from a separate accounting system.

- For budget doctoral students the funds allocated for research are a minimum of 7350 lei, which represents 25.34% of the total grant.

- for fee-paying doctoral students the funds allocated for research are a minimum of 1200 lei, which represents 20.00% of the total fee.

The list of conference papers is in Annex B.2.1.4.b.

The file " Tabel cheltuieli formare profesionala.pdf" has been provided, from which the amount of 625 lei results.

The estimated percentage is below the required limit of 10%.

Recommendation: Record and encourage the settlement of expenses incurred by students.

The indicator is unfulfilled.

Criterion A.2. Research infrastructure

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

The research infrastructure is aligned with doctoral studies' research lines and allows students to carry out the required experiments for the validation of their research works.

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.

The Interdisciplinary Doctoral School/Doctoral field of Electronic Engineering, Telecommunications and Information Technologies has the necessary space and material equipment (laboratory equipment, computers, specific software, apparatus, library, access to international databases, etc.) to carry out research activities in the field of Electronic Engineering, Telecommunications and Information Technologies.

The scientific research infrastructure consists mainly of laboratories belonging to the Department of Electronics, Computers and Electronic Engineering of the Faculty of Electronics, Communications and

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

Computers and the Regional Research and Development Centre for Innovative Materials, Processes and Products for the Automotive Industry - CRC&D-Auto.

Additionally, in the Faculty of Electronics, Communications and Computers, there are the research centres: "Modelling and Simulation of Processes and Systems" - abbreviated CCMSPS (room T-209, T-211)

The spaces in which are carried out the research activities and the apparatus, laboratory equipment, experimental platforms, computers, and basic and specific software are adequate for doctoral studies in the field of IETTI, allowing research activities in accordance with the assumed mission and objectives.

There is specific software for FPGA (Vivaldo) and an academic license for Matlab. (AS-3-License Matlab campus))

Recommendation: Access to IEEE database.

The indicator is fulfilled.

Criterion A.3. Quality of Human Resources

*general description of the criterion analysis.

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

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

Three supervisors from the five active supervisors that belongs to the doctoral field of Electronic Engineering, Telecommunications and Informational Technologies fully meet the current CNATDCU minimum standards. At least 50% therefore, the indicator is accomplished.

The sheets of fulfilment of the minimum requirements present in the internal evaluation report were consulted and the PhD supervisors were asked. The situation is as follows:

1. Anghelescu Petre - fulfils all conditions.
2. Tulbure Adrian - fulfils all conditions.
3. Lita Ioan - fulfils the conditions, except for subcategory A.2.1 concerning at least 3 articles in Q1 or Q2 rated journals.

Gavriloaia Gheorghe - fulfils the conditions, except for subcategory A.2.1 concerning at least 3 articles in Q1 or Q2 journals.

5. Jurian Mariana - does not meet all the conditions: A2-research activity, total score, A.2.1 relating to minimum 3 articles in Q1 or Q2 rated journals, Impact factor.

Recommendations: Fulfillment of minimum criteria by all PhD supervisors.

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.*

The situation of PhD supervisors is:

- 1 PhD supervisor: Conf. dr. ing Anghelescu Petre

- 1 affiliated PhD supervisor: Prof. dr. eng Tulbure Adrian

- 3 PhD supervisors working in the Interdisciplinary Doctoral School are retired from the University of Pitesti: Prof. dr. ing Lita Ioan, Prof. dr. ing Gavriloaia Gheorghe, Prof. dr. ing. Jurian Mariana.

We mention that two other full professors at the Department of Electronics, Computers and Electrical Engineering of the University of Pitesti meet the requirements for habilitation, have designed the habilitation thesis and are in the phase of submitting it (Prof. dr. eng. Oproescu Mihai, Prof. dr. eng. Ionescu Laurențiu).

The habilitation of two full professors is being considered: Conf. Oproescu Mihai (Mihai Oproescu - Affiliation declaration.pdf) and lecturer Ionescu Laurentiu (Laurentiu Ionescu - Affiliation declaration.pdf).

Recommendation: To complete the leaders with indefinite employment contracts.

The indicator is unfulfilled.

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.

The subjects of the advanced degree programme in the doctoral field of Electronic Engineering, Telecommunications and Information Technologies are taught exclusively by teachers who are doctoral/doctoral supervisors, professors, university lecturers with proven expertise in the field of the subjects taught.

The annex on expertise has been redrafted. File "Expertise Lita Ioan.pdf".

There are no specific recommendations.

The indicator is fulfilled.

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

At the time of elaboration of the self-evaluation report, within the doctoral field Electronic Engineering, Telecommunications and Informational Technologies, a number of 5 doctoral supervisors work, none of them coordinating more than 8 students at the same time.

There are no specific 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.

The scientific production of the five supervisors is considered to be adequate and over the required the minimal CNATDCU standards.

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

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.*

At least 50% of the PhD supervisors from the evaluated domain have a minimum of 5 Web of Science or ERIH indexed publications in journals with impact factor or other achievements with relevant significance for the respective domain.
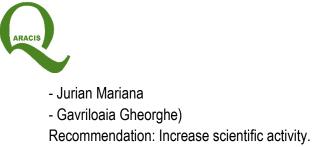
The list of publications of each supervisor is included in the supplementary documentation and demonstrates that the scientific production and the quality of journal is clearly above the requirements of the indicator.

There are no specific recommendations.
The indicator is fulfilled.

Performance Indicator *A.3.2.2. *At least 50% of the doctoral thesis advisors in a specific doctoral study domain continue to be active in their scientific field, and acquire at least 25% of the score requested by the 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.*

The minimum conditions compliance sheets for the last 5 years present in the internal evaluation report were consulted. The situation is as follows:

1. Anghelescu Petre - degree of fulfilment:
score required: 212,5 points.
score achieved: 779,798 points.
2. Tulbure Adrian - degree of achievement:
score required: 212,5 points.
score achieved: 603,98 points.
3. Lita Ioan - degree of achievement:
score required: 212,5 points.
score achieved: 395,22 points.
4. Gavriloaia Gheorghe - degree of achievement:
score required: 212,5 points.
score achieved: -.
5. Jurian Mariana - degree of achievement:
score required: 212,5 points.
score achieved: 133,95 points.
By subcategories are not met (25% in the last 5 years):
- Lita Ioan (A.2.1 - 3 items Q1|Q2)

- Jurian Mariana
- Gavriloaia Gheorghe)
Recommendation: Increase scientific activity.
The indicator is fulfilled.

Domain B. EDUCATIONAL EFFECTIVENESS
*general description of domain analysis.

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.

The institution that organizes the doctoral studies is able to attract candidates from outside the higher education institution or in greater numbers than the number of seats financed from the state budget.

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.

The analysis of the data in Anexa B.1.1.1-1 shows 12 - Master's level graduates of other higher education institutions in the country or abroad who have applied for admission to doctoral studies in the last five years, the calculated values at IOSUD level: 12:9, resulting in 1.33. The global value calculated for 5 years at this level is 1.66, (15 number of applicants in the last five years 9 - the number of places funded from the state budget offered in the field of doctoral studies IETTI), which proves that the institution is able to attract applicants from other universities, both national and foreign.

There are no specific recommendations.
The indicator is fulfilled.

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

The admission to the doctoral study program is clearly defined by the Doctoral School Regulations. Each applicant is individually evaluated attending to its profiles, previous studies and average grades, publications, awards and motivation and scientific interest. A personal interview is also conducted as part of the selection process. However, admission procedures should be visible at the doctoral school website, also in English. The procedures are adequately implemented and help to reduce the dropout rate below the required limit.

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.

Admission to doctoral study programs is based on the Methodology on organizing and conducting the competition for admission to doctoral study programs within the doctoral schools of the University of Pitesti in the academic year 2021-2022 – Annex B.1.2.1. - Admission methodology. The methodology provides, according to articles 16, 17 and 18, discussions and interviews with candidates on: the academic, research and professional performance of candidates, their interest in scientific research, publications in the field and a research topic proposal.

There are no specific recommendations.

The indicator is fulfilled.

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

The global dropout rate for the reported period is 0%, below the 30% limit.

There are no specific recommendations.

The indicator is fulfilled.

Criterion B.2. The content of doctoral programs

The training program is adequate and includes the compulsory subject about Ethics and academic integrity and Methodology of Scientific Research.

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 training program based on advanced university studies in the doctoral domain of Electronic Engineering, Telecommunications and Information Technologies is carried out in the first year of study through 4 common compulsory disciplines at doctoral level (Information Technology and Research Methodology, Statistical Processing and Optimal Signal Filtering, Ethics research, Scientometry and Academic Writing, Cyber Security) and two specialized disciplines adapted to the doctoral topics that are established by each PhD supervisor based on the competencies and research topics of the guided PhD students. The training plan through doctoral studies proposed for the academic years 2021-2024, is presented in Annex B.2.1.1 – Advanced university training program. In the program there is a discipline designed for the in-depth study of research methodology (B.2.1.1.a FD Information technology and research methodology) and one for statistical data processing (B.2.1.1.b FD Statistical processing and optimal filtering of signals).

There are no specific recommendations.

The indicator is fulfilled.

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

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

The training program based on advanced university studies in doctoral domain of Electronic Engineering, Telecommunications and Information Technologies is carried out in the first year of study and includes Research Ethics, Scientometry and Academic Writing. (Annex B.2.1.1 – Advanced university training program and B.2.1.1.c FD Research ethics, scientometrics and academic writing).

There are no specific recommendations.

The indicator is fulfilled.

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

IOSUD-UPIT has created mechanisms to ensure that the training program based on advanced university studies of a doctoral field aims at "learning outcomes", at level 8 EQF / CNC, according to the Recommendation of the Council of the European Union of 22.05.2017, on the European Framework of Qualifications - Annex.I.1.2.1 Procedura_nivel_8_EQF_CNC. Thus, for each discipline provided in the curriculum, a discipline sheet (syllabus) is elaborated (by the subject holder together with the holder of the applied activities), in which are mentioned the competences (professional and transversal), skills and attitudes that doctoral students should acquire them after completing it or through research activities.

After completing the subjects, students are questioned so as to prove the acquisition of knowledge, skills / abilities, competencies and responsibilities according to the subject sheets (B.2.1.1.a, B.2.1.1.b, B.2.1.1.c, B.2.1.1.d, B.2.1.1.e, B.2.1.1.f). Credit points are provided for each subject. The forms of evaluation of the study disciplines are exams, which are taken at the end of the semester in which the discipline takes place.

Students were surveyed according to the annex of the internal evaluation report: (Annex II.C.1.1.2.1), and the results (Annex II.C.1.1.2.2) were analysed by the CEAC-SDI together with the PhD supervisors of Electronic Engineering, Telecommunications and Information Technology.

There are no specific recommendations.

The indicator is fulfilled

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

PhD students in the IETTI field benefit from the advice and guidance of mentoring committees (mentors), which are established at the time of the PhD student's enrolment - annex to the PhD student contract (Annex B.2.1.4.a Mentors in Electronic Engineering).

This is done through regular meetings (set by each individual mentor), communication by email, participation in scientific events and preparation of scientific papers. Evidence of this is the scientific work published so far by PhD students and their mentors (Annex B.2.1.4.b List of PhD students & mentors' work).

There are no specific recommendations.

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

The indicator is fulfilled

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

Currently, 15 students are enrolled in the field of Electronic Engineering, Telecommunications and Informational Technologies The teaching staff includes 5 Doctoral supervisors in the field of Electronic Engineering, Telecommunications and Informational Technologies and 9 other teaching staff. Therefore, the ratio is 5:14, below the required limit 3:1.

There are no specific recommendations.

The indicator is fulfilled.

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

In the doctoral field of Electronic Engineering, Telecommunications and Information Technologies, no doctoral candidate has defended his/her doctoral thesis in the last 5 years. In this case the B.3. indicators are not applicable.

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

In the doctoral field of Electronic Engineering, Telecommunications and Information Technologies, no doctoral candidate has defended his/her doctoral thesis in the last 5 years.

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.*

In the doctoral field of Electronic Engineering, Telecommunications and Information Technologies, no doctoral candidate has defended his/her doctoral thesis in the last 5 years.

The indicator is not applicable.

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.*

In the doctoral field of Electronic Engineering, Telecommunications and Information Technologies, no doctoral candidate has defended his/her doctoral thesis in the last 5 years.

The indicator is not applicable.

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.

In the doctoral field of Electronic Engineering, Telecommunications and Information Technologies, no doctoral candidate has defended his/her doctoral thesis in the last 5 years.

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.*

In the doctoral field of Electronic Engineering, Telecommunications and Information Technologies, no doctoral candidate has defended his/her doctoral thesis in the last 5 years.

The indicator is not applicable.

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.*

In the doctoral field of Electronic Engineering, Telecommunications and Information Technologies, no doctoral candidate has defended his/her doctoral thesis in the last 5 years.

The indicator is not applicable.

Domain C. QUALITY MANAGEMENT

The Quality Assurance System is designed and implemented satisfactorily.

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

The Quality Assurance System is designed and implemented. There are procedures to monitor the activity of all the actors of the doctoral domain and to collect feedback information.

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.

There is a defined framework for Quality Assurance, with procedures that have been implemented. The framework includes procedures for collecting information about students and advisors, the training program and the infrastructure. In previous years the University of Pitesti did not have such data processing at PhD level, in this case the indicator C.1.1.2 is partially fulfilled.

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.

The PhD supervisors of the Interdisciplinary Doctoral School report annually on the SIIIMADC platform of the University of Pitesti (https://www.upit.ro/profesor/home) the results of the research activities of the previous year. This annual report is mandatory, and reporting is done based on the CNATDCU criteria in force at the time. An example of such a report is presented in Annex II.C.1.1.1.2.

The evaluation of PhD supervisors is done annually according to the Methodology for the internal evaluation of the performance of PhD supervisors in doctoral schools (Annex II.C.1.1.1.3).

The research activity is carried out in the laboratories of the research centres where the PhD supervisors and mentors work. PhD supervisors and mentors of PhD students in the field of IETTI are affiliated to the Regional Research and Development Centre for Innovative Materials, Processes and Products for the Automotive Industry - CRC&D-Auto.

In order to ensure the quality of the activities carried out in the research centres, each centre is evaluated annually according to the Operational Procedure: Establishment, Internal Certification and Evaluation of Research Units (Annex II.C.1.1.4.) The research centres that meet the minimum standards required (Annex II.C.1.1.1.5)

There are no specific recommendations.

The indicator is fulfilled.

Performance Indicator *C.1.1.2. *Mechanisms are implemented during the stage of the doctoral study program to enable feedback from doctoral students allowing 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.*

At the level of the Interdisciplinary Doctoral School, there is a questionnaire to identify the needs of doctoral students and to assess their general level of satisfaction with the doctoral programme they are following, in order to continuously improve the academic and administrative processes.

Thus, in the academic year 2020-2021, the questionnaire was carried out by the study programme leader and sent to the PhD students via the Google platform (Annex II.C.1.1.2.1).

The results were analysed by the CEAC-SDI together with the study programme leader, (Annex II.C.1.1.2.2 Response 10 PhD students - Satisfaction form) in order to increase the PhD students' satisfaction with the PhD programme Electronic Engineering, Telecommunications and Information Technology.

In previous years the University of Pitesti did not have such data processing at PhD level.

Recommendations: Continue the implementation of evaluation mechanisms and develop procedures for evaluation.

The indicator is partially fulfilled.

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

All the relevant information regarding the doctoral field is available through the website. Students have access to the electronic resources relevant for the doctoral field and all the reseach facilities except IEEE database.

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

The links for the doctoral school regulations, admission regulations, doctoral studies contract, information for public defence of the thesis and required standards, the content of training programs, the academic and scientific profile of supervisors, list of PhD students and links to abstracts of doctoral theses to be defended publicly are provided and they contain the expected information.

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.

The links for the doctoral school regulations, admission regulations, doctoral studies contract, information for public defence of the thesis and required standards, the content of training programs, the academic and scientific profile of supervisors, list of PhD students and links to abstracts of doctoral theses to be defended publicly are provided and they contain the expected information.

There are no specific 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.

Students have access to the electronic resources though international databases (except IEEE) and the University of Pitesti (UPIT) library, to anti-plagiarism software and labs and equipments required for their research.

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.

PhD students have access to international databases, UPIT being a member of the ANELIS+ project (Annex II.C.2.2.1.1 ANELIS access). How students can access these databases can be found at: http://cat- biblioteca.upit.ro/bibl/Pagina%20WEB/Site_nou/BazeDate.htm . Access can be from a computer with UPIT IP or it can be mobile.

Relevant databases for the IETT PhD field: Springerlink, Science Direct, MathSciNet, Scopus. There is also access to the integrator database (scientometric data) Web of Science.

UPIT has and uses a computer program (www.sistemantiplagiat.ro) for checking the similarity percentage in all PhD theses. Thus, according to the Procedure for electronic preventive anti-plagiarism control of doctoral theses (Annex II.C.2.2.1.2), each doctoral student has access, on request and with the

agreement of the doctoral supervisor, to this electronic system for checking the degree of similarity with other existing scientific or artistic creations.

Recommendation: Contract access to the IEEE database.

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.*

Doctoral students can check the similarity of their own work through their PhD supervisors using the SEMPLAG program. An example is given in Annex II.C.2.2.1 Access SEMPLAG.

There are no specific recommendations.

The indicator is fulfilled.

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

All doctoral students have access to scientific research laboratories or other facilities depending on the specifics of the field / fields within the doctoral school, according to internal rules.

During the meetings with students and graduates, it was confirmed the availability of previous facilities.

There are no specific recommendations.

The indicator is fulfilled.

Criterion C.3. Internationalization

The doctoral field keeps several ERASMUS agreements with foreign institutions and students have participated in mobilities for attending conferences or courses. Invited lecturers have also participated in the training program.

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

The doctoral field keeps several ERASMUS agreements with foreign institutions and students have participated in mobilities for attending conferences or courses. There is no participation in international educational fairs.

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.*

The IETTI PhD field has mobility agreements with foreign universities conducting doctoral research in the IETTI field through the Centre for International Relations and the ERASMUS Office (https://www.upit.ro/ro/international), which aim at the mobility of doctoral students and teaching staff. A detailed list of these agreements is presented in Annex C.3.1.1.a.

A total of 10 doctoral students in the IETTI field participated in international scientific conferences according to Annex B.2.1.4.b List of doctoral students' papers & mentors. The percentage of participations is 10 / 15 66.66 % > 35%.

There are no specific recommendations.

The indicator is fulfilled.

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

Within the IETTI doctoral field, there have been collaborations with European partner universities, in which cotutelle PhDs have also been carried out, but outside the evaluation period (2016-2020).

Recommendation: Increase the number of cotutelle theses.

The indicator is fulfilled.

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

The internationalization of doctoral activities is supported at IOSUD- UPIT level through concrete measures such as: participation in educational fairs to attract international doctoral students. Also, in the framework of lectures given by the teachers with activities in the doctoral field of Electronic Engineering, Telecommunications and Information Technologies on the occasion of international mobilities (Annex C.3.1.1.a International Collaboration Agreements) (Annex C.3.1.3) International Teacher Mobilities) the possibilities of collaboration in the field of scientific research, including doctoral collaboration, are presented.

There is no participation in international educational fairs. There are educational participations and sections in international conferences in this field:

- ECAI: International Conference on Electronics, Computers and Artificial Intelligence;
- SIITME: International Symposium for Design and Technology in Electronic Packaging

Recommendation: Access to educational events/trade fairs.

The indicator is partially fulfilled.

IV. SWOT Analysis

Strengths:	Weaknesses:
- Supervisors show an adequate scientific production - Fluid relationships between students and supervisors.	- The low level of strong internationalization for the time being - A low number of grant applications proposed/obtained by PhD supervisors and the number of PhD students involved in research grants.
Opportunities:	Threats:

- The existence of a fruitful collaboration in the IETTI domain with relevant international universities	- IETTI research without IEEE database - In the doctoral field of Electronic Engineering, Telecommunications and Information Technologies, no doctoral candidate has defended his/her doctoral thesis in the last 5 years.

V. Overview of judgments awarded and of the recommendations

No.	Type of indicator (*, C)	Performance indicator	Judgment	Recommendations
1		A.1.1.1	Partially Fulfilled	Develop and approve appropriate procedures.
2		A.1.1.2	Fulfilled	
3		A.1.2.1	Fulfilled	
4		A.1.2.2	Fulfilled	
5		A.1.3.1	Partially Fulfilled	Increase the number of grant applications proposed/obtained by PhD supervisors and the number of PhD students involved in research grants.
6	*	A.1.3.2	Fulfilled	
7	*	A.1.3.3	Unfulfilled	Record and encourage the settlement of expenses incurred by students.
8	C	A.2.1.1	Fulfilled	
9	C	A.3.1.1	Fulfilled	
10	*	A.3.1.2	Unfulfilled	Please complete the leaders with indefinite employment contracts.
11		A.3.1.3	Fulfilled	
12	*	A.3.1.4	Fulfilled	
13	C	A.3.2.1	Fulfilled	
14	*	A.3.2.2	Fulfilled	
15	*	B.1.1.1	Fulfilled	
16	*	B.1.2.1	Fulfilled	
17		B.1.2.2	Fulfilled	
18		B.2.1.1	Fulfilled	
19		B.2.1.2	Fulfilled	
20		B.2.1.3	Fulfilled	
21		B.2.1.4	Fulfilled	
22	C	B.2.1.5	Fulfilled	
23	C	B.3.1.1	Not applicable	nobody has defended his/her doctoral thesis in the last 5 years

24	*	B.3.1.2	Not applicable	nobody has defended his/her doctoral thesis in the last 5 years
25	*	B.3.2.1	Not applicable	nobody has defended his/her doctoral thesis in the last 5 years
26	*	B.3.2.2	Not applicable	nobody has defended his/her doctoral thesis in the last 5 years
27		C.1.1.1	Fulfilled	
28	*	C.1.1.2	Partially Fulfilled	Continue the implementation of evaluation mechanisms and develop procedures for evaluation.
29	C	C.2.1.1	Fulfilled	
30		C.2.2.1	Partially Fulfilled	Contract access to the IEEE database.
31		C.2.2.2	Fulfilled	
32		C.2.2.3	Fulfilled	
33	*	C.3.1.1	Fulfilled	
34		C.3.1.2	Fulfilled	
35		C.3.1.3	Partially Fulfilled	Access to educational events/trade fairs.

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 present periodic external evaluation report was conducted for the evaluation of the Doctoral Studies Area Electronic Engineering, Telecommunications and Informational Technologies (CTI), Doctoral School (DS), IOSUD UPIT.

From the analysis carried out on the Internal Evaluation Report, following the meetings held at all levels, as well as from the on-site visit to inspect the teaching and research infrastructure, it emerged that overall the Electronic Engineering, Telecommunications and Informational Technologies doctoral degree area has a clear and well-defined mission, well thought-out objectives and programmes, successfully responding to growing market needs, being an interdisciplinary doctoral programme providing highly qualified specialists for research-development-innovation and educational work in higher education institutions, research institutes and R&D departments of companies in the field.

Doctoral students have access to a properly dimensioned research infrastructure of the Doctoral School, benefiting also from a university library with extensive bibliographical resources, including online, as well as the support of a modern research infrastructure.

The most quality indicators related to the standards and evaluation criteria are fulfilled, except some non critical indicators which are partially fulfilled or unfulfilled.

I am satisfied with the overall doctoral training programme. The faculty has designed and implemented an interested PhD program in the field of Electronic Engineering, Telecommunications and Informational Technologies.

Budapest, 2021. december 10.

International Evaluator

Dr. habil. Gabor Kiss PhD.