

## External evaluation report for the setting up (establishment) of a doctoral study domain

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

This chapter will contain a brief presentation of:

- 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 Panel** etc.);
- details about the doctoral school(s) of which the doctoral domain under review will be part (number of doctoral advisors, number of students, institutional context, short history etc.);
- details about the doctoral study domain under review (institutional context);

Transilvania University of Braşov (UniTBv) organizes doctoral studies within the Institution Organizing Doctoral Studies – Transilvania University of Braşov (IOSUD-UniTBv).

This periodic external evaluation report was carried out for the evaluation of the Mechatronics and Robotics doctoral programme of IOSUD “Transilvania” University of Brasov (UTBV).

Type of evaluation: periodic external evaluation

Evaluation visit period: 08 November - 12 November 2021.

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<sup>1</sup> When applicable, gendered information will be presented as well.



Composition of the expert evaluation committee:

1. Prof. Dr. Dorian Cojocaru – Head of the evaluation committee, University of Craiova, Romania
2. Prof. Dr. Radu Catalin Tarca- Expert evaluator University of Oradea, Romania
3. Prof. univ. dr. eng. Gabor Kiss - international expert, Obuda University, Budapest, Hungary
4. Petrisor Laurentiu Tuca - student doctorand, “Politehnica” University from Bucharest, România.

Doctoral studies represent the third cycle of university studies and enable the acquisition of an 8-level qualification according to the European Qualifications Framework (EQF) and to the National Qualifications Framework.

Transilvania University of Braşov (UniTBv) organizes doctoral and post-doctoral studies within the Organizing Institution of Doctoral University Studies - Transilvania University of Braşov, hereinafter referred to as IOSUD- UniTBv (<https://www.UniTBv.ro/cercetare/doctorat-postdoctorat-si-abilitare/iosud.html>). The Rector of Transilvania University Braşov is the legal representative of IOSUD- UniTBv. IOSUD- UniTBv is managed by the Council for University Doctoral Studies, hereinafter referred to as (<https://www.UniTBv.ro/cercetare/doctorat-postdoctorat-si-abilitare/despre-scoala-doctorala/csud>). CSUD- UniTBv, which is headed by a director.

The doctoral university study programmes are organized and conducted within IOSUD- UniTBv, through the Interdisciplinary Doctoral School (SDI) (<https://www.UniTBv.ro/cercetare/doctorat-postdoctorat-si-abilitare/despre-scoala-doctorala/echipa-sdi>). The Interdisciplinary Doctoral School (SDI) is headed by the Director of the doctoral school and the Council of the Interdisciplinary Doctoral School (C-SDI), SDI being integrated in the structure of the Vice-Rectorate for scientific research and informatization.

The Interdisciplinary Doctoral School (SDI) has been operational within IOSUD- UniTBv since the 1st of October 2010, having been established by the Decision of the Senate of Transilvania University of Braşov of July 27, 2010. Previously, according to GD 567/15 June 2005, the Senate Office of Transilvania University of Braşov decided (HBS no. 43 / 09.09.2005) the establishment of the Doctoral Department on 9 September, 2005. The basic mission of this department was to coordinate all doctoral activities at the university.

Currently, the doctoral field of Mechatronics and Robotics not exist yet, the number of PhD students are not relevant as the total number of doctoral students graduated from the doctoral program in the last 5 years.

## II. Methods used

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

- Review of the Internal evaluation report for the doctoral study domain under review and its annexes;
- Review of the documents provided by the IOSUD in physical format during the



- evaluation visit (if such documents were requested);
- Review of the documents, data and information available on the website of the IOSUD/the Doctoral School(s), in electronic format;
  - Visiting the buildings of the institution, including (an indicative and non-exhaustive list, may change according to the context): classrooms; laboratories; the institution's library; the Career Counselling and Guidance Centre; lecture halls for students; student residences; student cafeteria; sports facilities, etc.;
  - Meeting/discussions with members of the management of the Doctoral School where the doctoral study domain under review will operate;
  - Meeting/discussions with doctoral advisors in the doctoral study domain under review;
  - Meeting/discussions with representatives of the various structures of the IOSUD/Doctoral School where the doctoral study domain under review is operating: the Council of the Doctoral School, the University Senate, the Board of Directors, the Evaluation and Quality Assurance Commission, the Quality Assurance Department, the Ethics Commission (including with the student representatives of these structures); the Career Counselling and Guidance Centre; student organizations; secretariats; various departments / administrative offices (Social/Student residences-Cafeterias etc.), etc.;

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 meetings and the visit to the educational and research infrastructure.

The 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 planned doctoral school will have the proven institutional capacity to accommodate the doctoral studies required by the legislation. The research infrastructure is adequate to support students and supervisors and the quality of human resources is also good and over the required limits

Criterion A.1. Administrative and managerial institutional structures, and financial resources

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

The planned Doctoral School has adequately implemented all the aspects included in the specific legislation of doctoral studies. Both indicators under the standard A.1.1. are fulfilled and there is evidence that confirm the application of specific regulations, being this information accessible to all students.

**Performance indicator A.1.1.1.** The existence of specific regulations and their application at the level of the doctoral school that the doctoral domain is a part of:

- 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 the CSD, and evidence that such elections were conducted;
- c) methodologies for organising and conducting doctoral studies (admission of doctoral students, completion of doctoral studies);
- d) existence of mechanisms for recognising the status of a doctoral advisor and the equivalence of a doctoral degree obtained abroad;
- e) functional management structures (Council of the doctoral school), including proof of the regular frequency of convening their 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 general framework for doctoral training is set out in the IOSUD Institutional Regulations. The internal regulations cover aspects such as the procedures for the election of the Directors of the Council of the Doctoral School (CSD), the members of the SCD and the representatives of doctoral students, the organisation of doctoral studies, including admission procedures, the recognition of doctoral supervisors, the establishment of functional governance structures (Doctoral School Council, CSD) to coordinate doctoral activities, study contracts with all students admitted to doctoral programmes, and internal procedures for the analysis and approval of proposed topics.

The evidence supporting the achievement of the indicator is the general framework and internal procedures of the doctoral school, the study contract and the internal procedures governing the various aspects of the organisation of doctoral studies. In addition, there is evidence that CSD meetings are held on a regular basis, with minutes of the meetings containing the list of participants, the date and the main agreements reached at the meetings.

There are no specific recommendations.



*The indicator is fulfilled.*

**Performance indicator A.1.1.2.** The doctoral school's Regulations include mandatory criteria, procedures and standards concerning the aspects specified in art. 17, para. (5) of Government Decision no. 681/2011 on the approval of the Code of Doctoral Studies, as further amended and supplemented.

The Regulation of the planned 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 necessary logistic resources to carry out the mission of the doctoral studies.

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.

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 Information System of the University of Brasov records PhD students' activities: exam results, reports, research activity assessment and participation in national and international scientific events, as well as the publication of some specialized research papers. Supplementary documentation provides a description of the information system, its administration and management procedures and a print screen of a PhD student web page. Each PhD student has access to the system through an account and a password,

There are no specific recommendations.

*The indicator is fulfilled.*



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

IOSUD ensures the verification of the authenticity and originality of doctoral theses and other research works using [www.sistemantiplagiat.ro](http://www.sistemantiplagiat.ro) software, recognized by the National Council for Attesting the University Titles, Diplomas and Certificates (CNATDCU). The Doctoral School use an other application for verifying the percentage of similarities: **Turnitin** If the similarity index report is inadequate, the Doctoral candidate is recommended to revise the thesis and resubmit it.

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.***

Criterion A.2. Research infrastructure

Standard A.2.1. The IOSUD has a modern research infrastructure to support the performance of specific doctoral study 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 research activities within the field of Mechatronics and Robotics are carried out in the existing Research Centers within the ICDT.

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 Mechatronics and Robotics, allowing research activities in accordance with the assumed mission and objectives.

There are no specific recommendations.

***The indicator is fulfilled.***

Criterion A.3. Quality of human resources

Standard A.3.1. For each domain, there is qualified staff having the experience required for carrying out the doctoral program.

At the level of each doctoral field there is enough qualified staff to ensure a quality educational process.



**Performance indicator A.3.1.1.** Minimum three doctoral thesis advisors work 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.

3 doctoral supervisors are carrying out their activity, according to Table A.3.1.1-1. Together with the 3 advisors, within the department there is a 4-th doctoral supervisor (Prof. Dr. Claudiu Pozna) in the field of Mechatronics and Robotics, which performs his activity in the Information Technology area.

Three supervisors from the four active supervisors that belongs to the doctoral field of Mechatronics and Robotics fully meet the current CNATDCU minimum standards. At least 50% therefore, the indicator is accomplished.

The supplementary documentation provides the award of the certificate of Habilitation in the field of Systems Engineering and the CVs of the Doctoral supervisors.

There are no specific recommendations.

***The indicator is fulfilled.***

**Performance indicator\* A.3.1.2.** At least 50% of the doctoral advisors in the doctoral domain under review are tenured professors within the IOSUD and have a full-time employment contract for an indefinite period.

Three from the 3 Doctoral supervisors are employed full time within the “Transilvania” University of Brasov (UTBV), based on a permanent employment contract.

There are no specific 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 associate professors / 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 academic subjects from the training programme, which rely on advanced academic studies in the field, are taught by members of the teaching staff or by researchers who are qualified PhD supervisors/habilitated, either Professor/CS I, Associate Professor/ CS II with proven expertise in the domain of the academic subjects that they teach or other specialists in the field who meet the standards



set by the institution for the above mentioned teaching and research positions, according to the provisions of the law.

It follows that the subjects in the training program based on advanced university studies related to the field of Mechatronics and Robotics are supported by teachers or researchers with proven expertise in the field of the subjects taught.

There are no specific recommendations.

***The indicator is fulfilled.***

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

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

**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 visibility within the past 5 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 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 5 years by their membership on the boards of professional associations, membership in organising 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 5 years.

The three supervisors achieved in the last 5 years more than 25% of the score required by the CNATDCU minimum standards.

There are no specific recommendations.

***The indicator is fulfilled.***

## Domain B. EDUCATIONAL EFFECTIVENESS.

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

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.

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. The procedures are adequately implemented and help to reduce the dropout rate below the required limit.

**Performance indicator\* B.1.2.1.** Admission in the doctoral study programmes is based on selection criteria including the academic, research and professional performance of the candidates; their interest for scientific or artistic/sports research; publications in the domain, and a proposal of a research subject. Interviewing the candidate is mandatory as part of the admission procedure.

The competition for admission to doctoral studies takes the form of a specialised examination, with one or more tests (written or oral) specific to the doctoral field, including a compulsory interview. On the proposal of the doctoral supervisors, the topics for the competition are approved by the Council of the SDI in consultation with the coordinators of the doctoral fields. The number and type of competitions for each



doctoral field shall be approved by the Council of the SDI on the basis of proposals from the coordinators of the doctoral fields, taking into account their specificities.

In the specialised examination, each member of the competition committee will assess the candidate's level of knowledge of the issues relevant to the field in question and his/her knowledge of the latest research on the subject of the doctoral thesis, with marks from 1 to 10 (based on a review of the literature). The interview is also designed to assess the candidate's ability to take theoretical, experimental and methodological initiatives in relation to the proposed research and his/her previous research experience. There are no specific recommendations.

***The indicator is fulfilled.***

Criterion B.2. The content of the doctoral programs

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

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

**Performance indicator B.2.1.1.** The training program based on advanced academic studies includes at least 3 disciplines relevant for the scientific research training of doctoral students, out of which at least one discipline focuses on the in-depth study of research methodology and/or statistical data processing.

The training program of the first year of doctoral studies in the field includes relevant disciplines for the training in scientific research of doctoral students.

Discipline Management and resources in research projects is an in-depth picture of the research methodology, aiming to establish the purpose and objectives, their correct formulation, but also the work packages and the establishment of the available budget.

Statistics in research approaches the elaboration of statistical methods and concepts in order to support doctoral students in understanding the interpretation of statistical results.

Evaluation of research results, Creativity and ingenuity, Intellectual property disciplines to help doctoral students follow the right direction throughout the research process.

There are no specific recommendations.

***The indicator is fulfilled.***

**Performance indicator B.2.1.2.** At least one discipline is dedicated to ethics in scientific research and intellectual property, or there are well-defined topics on these subjects within a discipline taught in the doctoral program.



Independent evaluation of a scientific research using ethical principles, values and standards, taking responsibility for the application of ethical norms in scientific research and academic life are skills that, once acquired, have direct applicability in critical analysis, in conditions of independence, problems and solutions. appropriate to a scientific research specific to the doctoral field and the responsible application of ethical norms in the design, implementation and independent evaluation of own scientific research as well as in the dissemination and publication of articles will be the results of the training.

The way of structuring information in a scientific article and making presentations of research results are the results of knowing and understanding how to structure information, how to write and write a scientific text or public presentation of results and the development of critical thinking, management time resources, relationships and teamwork.

There are no specific recommendations.

***The indicator is fulfilled.***

**Performance indicator B.2.1.3.** The IOSUD has the mechanisms in place to ensure that the academic training program based on advanced higher education studies related to the evaluated domain addresses the “learning outcomes”, specifying the knowledge, skills, and the responsibility and autonomy that doctoral students should acquire after completing each discipline or through the research activities<sup>2</sup>.

The training program based on advanced university studies comprises two distinct modules, intended for the formation of transversal competences useful in successfully completing the doctoral program in the Mechatronics and Robotics doctoral field (PPUA module), respectively for acquiring knowledge and training specialized skills in direct correlation with the doctoral / research topic, approached by each doctoral student within the doctoral field.

In addition to the subject sheets, in October 2018 the Synthetic Discipline Sheet model was created and implemented. The synthetic presentation sheets of the disciplines are internal SDI documents, meant to briefly illustrate to the doctoral students the objectives, the content of each discipline, respectively the competences formed and the learning outcomes. The document is intended for doctoral students to guide them in compiling the individual doctoral program, respectively:

- choice of optional subjects (where available);
- implementation of the facility to obtain 10 credits from other courses / internships (outside IOSUD) - generically called disciplines of choice, which form the transversal skills necessary for the field, provided the formation of useful transversal skills.

There are no specific recommendations.

***The indicator is fulfilled***

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<sup>2</sup> Or by what the graduate should know, understand and be able to do, according to the provisions of the Methodology for the listing and registration of higher education qualifications in the National Register of Qualifications in Higher Education (RNCIS) approved by the Order of the Minister of National Education no.3475/2017 with subsequent amendments and additions.



## 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. The institutional framework is in place, and policies and procedures are applied for the internal assurance of the relevant quality.

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.

**Performance indicator C.1.1.1.** The doctoral school to which the doctoral study domain belongs demonstrates that the internal evaluation and quality assurance process of the study domain is carried out constantly, according to a procedure developed and applied at the level of the IOSUD, including an evaluation of the following mandatory criteria:

- a) the scientific work of doctoral advisors;
- b) the infrastructure and logistics needed for carrying out the research activity;
- c) the regulations and procedures based on which doctoral studies are organised;
- d) the scientific activity of doctoral students;
- e) the training program based on advanced higher education studies of doctoral students;
- f) social and academic support services (including for participation in various events, publishing papers, etc.) and counselling services available for the doctoral students.

For the purpose of internal evaluation and monitoring the evolution of the Interdisciplinary Doctoral School (SDI) and of the doctoral fields operating within SDI, the following methodologies were developed and implemented (covering the criteria / aspects mentioned in this indicator - the doctoral supervisors' scientific activity, the infrastructure and logistics necessary to carry out the research activity, the procedures and the subsequent rules for the organization of doctoral studies):

- Methodology on the internal evaluation of the Interdisciplinary Doctoral School within IOSUD-UniTBv (made and applied in 2016);



▪ Methodology for periodic internal evaluation of the doctoral supervisors' activity (made and applied in 2018).

There are no specific recommendations.

***The indicator is fulfilled.***

**Performance indicator\* C.1.1.2.** Mechanisms are implemented during the doctoral study program to enable identification of the doctoral students' 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.

SDI has created appropriate mechanisms to collect the feed-back of the doctoral students on their needs and level of satisfaction with the doctoral study programme. The feed-back from the doctoral students resulting from their periodical consultation, represents an important background in the decision making mechanism on the modification / actualisation of curricula, respectively the structure and content of the PPUA. The Council of SDI annually analyses the content / structure of the PPUA and its relevance in the training of doctoral students in order to ensure the formation of useful skills for each doctoral field.

At the level of IOSUD-UNITBV, respectively of the Interdisciplinary Doctoral School (SDI), this specific mechanism for collecting feedback from doctoral students was implemented in 2017.

The doctoral students' consultation covers 3 aspects (criteria):

1. The assessment of the transversal skills module PPUA 1- with 6 sub-criteria regarding the content of the disciplines, the relevance of the trained skills, the professors' performance, the number of hours- the time budget, the form of evaluation and the organization of the activity by SDI, in a grading system from 1 to 5, in which 1 means inadequate, and 5 – adequate;
2. Global assessment of the usefulness of the transversal skills module PPUA 1, on a scale from 1 to 10, from 1 – useless to 10 – very useful.
3. Recommendations / proposals on PPUA 1 disciplines: disciplines that should be replaced, disciplines that should be introduced, other suggestions.

The PhD students' proposals aimed at introducing the discipline "Thesis elaboration techniques" and replacing the discipline "Creativity and invention".

The results of the consultation and the concrete proposals of the doctoral students and doctoral supervisors followed by their analysis in the scientific committees and the plenary of the SDI Council underlay the decisions on certain adjustments in the curricula. The 2018 consultation led to the reconfiguration of curricula and the content of some disciplines for the fields of Engineering and Marketing, implemented in 2018-2019. Thus, the course Statistics in research was differentiated for the fields Engineering sciences and Marketing, while for the engineering fields were configured two packages of elective courses: Creativity and inventics / Intellectual property and Statistics in research / Acquisition and processing of experimental data. The 2017 consultation led to changes in the curriculum for the field of Music, starting with the academic year 2017-2018.



It shows the consultation of the doctoral students and, also, of the graduates with validated PhD title is an useful mechanism and valuable tool to be further periodically implemented with a view of identifying adequate solutions to continuously improve the academic and administrative processes within the doctoral school, to ensure the learning outcomes and development of useful skills and competencies.

There are no specific recommendations.

***The indicator is 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 will have access to the electronic resources relevant for the doctoral field and all the research facilities.

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

**Performance indicator C.2.1.1.** Subject to compliance with the data protection regulations in force, the IOSUD publishes the following types of information on the website of the higher education institution:

- a) the regulations of the doctoral school;
- b) the admission regulations;
- c) the doctoral study contract;
- d) the study completion regulation including the procedure for the public presentation of the thesis;
- e) the content of the training programs 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 in the domain concerned, with basic information (year of enrolment; advisor);
- h) information on the standards for developing the doctoral thesis;
- i) links to the summaries of the doctoral theses to be presented publicly, as well as the day, time and place where they will be presented, at least 20 days before the presentation.

On the website of IOSUD-Transilvania University of Braşov, which also includes a section dedicated to the Interdisciplinary Doctoral School, as well as on the intranet platform of the University – section Doctorate, all the information specified in this indicator is available for consultation

There are no specific recommendations.

***The indicator is fulfilled.***



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

Students will have access to the electronic resources through international databases and the “Transilvania” University of Brasov (UTBV) 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.

All Doctoral students and post-graduates from the “Transilvania” University of Brasov (UTBV) will have free access to the academic databases relevant in the field of Mechatronics and Robotics.

There are no specific recommendations.

***The indicator is fulfilled.***

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

For the consolidation of the educational activities at Transilvania University of Braşov, software services were purchased to verify the originality of the studies, through Turnitin software.

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 a set of internal regulations.

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.

For the doctoral field Mechatronics and Robotics, the students will have access to the resources of the Robotics, Vision and Control Laboratory (RovisLab – [www.rovislab.com](http://www.rovislab.com)), which has as main objective the research in the field of robotics and applied artificial intelligence in robotics.

There are no specific recommendations.

***The indicator is fulfilled.***



## SWOT analysis

<p><u>Strengths:</u></p> <p>-Young researchers with an internationally comparable publication record. High level of infrastructure facilities for research.</p>	<p><u>Weaknesses:</u></p> <p>- With a small number of researchers, the loss of 1-2 researchers can have serious consequences. It is important to recruit new doctoral students</p>
<p><u>Opportunities:</u></p> <p>making good use of industrial links and available projects to sustain a high-level but fast-obsolete research infrastructure</p>	<p><u>Threats:</u></p> <p>-</p>

## 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 that the doctoral domain is a part of:</p> <ul style="list-style-type: none"> <li>a) the internal regulations of the doctoral school;</li> <li>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 the CSD, and evidence that such elections were conducted;</li> <li>c) methodologies for organising and conducting doctoral studies (admission of doctoral students, completion of doctoral studies);</li> <li>d) existence of mechanisms for recognising the status of a doctoral advisor and the equivalence of a doctoral degree obtained abroad;</li> <li>e) functional management structures (Council of the doctoral school), including proof of the regular frequency of convening their meetings;</li> <li>f) the contract for doctoral studies;</li> <li>g) internal procedures for the analysis and approval of proposals regarding the training for doctoral study programs based on advanced academic studies.</li> </ul>	fulfilled	



No.	Type of indicator (PI, PI*, CPI)	Performance indicator	Judgment	Recommendations
2.	PI	<b>A.1.1.2.</b> The doctoral school's Regulations include mandatory criteria, procedures and standards concerning the aspects specified in art. 17, para. (5) of Government Decision no. 681/2011, as further amended and supplemented.	fulfilled	
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.	fulfilled	
4.	PI	<b>A.1.2.2.</b> The existence and use of an appropriate software and evidence of its use to verify the percentage of similarity in all doctoral theses.	fulfilled	
5.	CPI	<b>A.2.1.1.</b> The venues and the material equipment available to the IOSUD/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	
6.	CPI	<b>A.3.1.1.</b> Minimum three doctoral thesis advisors work 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	
7.	PI *	<b>A.3.1.2.</b> At least 50% of the doctoral advisors in the doctoral domain under review are tenured professors within the IOSUD and have a full-time employment contract for an indefinite period.	fulfilled	



No.	Type of indicator (PI, PI*, CPI)	Performance indicator	Judgment	Recommendations
8.	PI	<p><b>A.3.1.3.</b> The study subjects in the education programme 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 associate professors / 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.</p>	fulfilled	
9.	CPI	<p><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 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 organising committees of arts events and international competitions, membership on juries or umpire teams in artistic events or international competitions.</p>	fulfilled	
10.	PI *	<p><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 for acquiring</p>	fulfilled	



No.	Type of indicator (PI, PI*, CPI)	Performance indicator	Judgment	Recommendations
		their enabling certificate, based on their scientific results within the past five years.		
11.	PI *	<b>B.1.2.1.</b> Admission in the doctoral study programmes is based on selection criteria including the academic, research and professional performance of the candidates; their interest for scientific or artistic/sports research; publications in the domain, and a proposal of a research subject. Interviewing the candidate is mandatory as part of the admission procedure.	fulfilled	
12.	PI	<b>B.2.1.1.</b> The training program based on advanced academic studies includes at least 3 disciplines relevant for the scientific research training of doctoral students, out of which at least one discipline focuses on the in-depth study of research methodology and/or statistical data processing.	fulfilled	
13.	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	
14.	PI	<b>B.2.1.3.</b> The IOSUD has the mechanisms in place to ensure that the academic training program based on advanced higher education studies related to the evaluated domain addresses the “learning outcomes”, specifying the knowledge, skills, and the responsibility and autonomy that doctoral students should acquire after completing each discipline or through the research activities.	fulfilled	
15.	PI	<b>C.1.1.1.</b> The doctoral school to which the doctoral study domain belongs demonstrates that the internal evaluation and quality assurance process of the study domain is carried out constantly, according to a procedure developed and applied at the level of the IOSUD, including an evaluation of the following mandatory criteria: a) the scientific work of doctoral advisors; b) the infrastructure and logistics needed for carrying out the research activity;	fulfilled	

No.	Type of indicator (PI, PI*, CPI)	Performance indicator	Judgment	Recommendations
		<p>c) the regulations and procedures based on which doctoral studies are organised;  d) the scientific activity of doctoral students;  e) the training program based on advanced higher education studies of doctoral students;  f) social and academic support services (including for participation in various events, publishing papers, etc.) and counselling services available for the doctoral students.</p>		
16.	PI *	<p><b>C.1.1.2.</b> Mechanisms are implemented during the doctoral study program to enable identification of the doctoral students' 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.</p>	fulfilled	
17.	CPI	<p><b>C.2.1.1.</b> Subject to compliance with the data protection regulations in force, the IOSUD publishes the following types of information on the website of the higher education institution:  a) the internal regulations of the doctoral school;  b) the admission regulations;  c) the doctoral study contract;  d) the study completion regulation including the procedure for the public presentation of the thesis;  e) the content of the training programs 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 in the domain concerned, with basic information (year of enrolment; advisor);  h) information on the standards for developing the doctoral thesis;  i) links to the summaries of the doctoral theses to be presented publicly, as well as the day, time and place where they will be presented, at least 20 days before the presentation.</p>	fulfilled	



No.	Type of indicator (PI, PI*, CPI)	Performance indicator	Judgment	Recommendations
18.	PI	<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.	fulfilled	
19.	PI	<b>C.2.2.2.</b> Each doctoral student, upon request, has access to an electronic system for verifying the degree of similarity with other existing scientific or artistic works.	fulfilled	
20.	PI	<b>C.2.2.3.</b> All doctoral students have access to the scientific research laboratories or to other facilities depending on the specific domain / domains within the doctoral school, according to a set of internal regulations.	fulfilled	

## Conclusions and general recommendations

The present external evaluation report was conducted for the evaluation of the planned Doctoral Studies Area Mechatronics and Robotics, Doctoral School, IOSUD UniTBv.

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 planned Mechatronics and Robotics doctoral study domain has a clear and well-defined mission, well thought-out objectives and programmes.

Doctoral students will 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.

All quality indicators related to the standards and evaluation criteria are fulfilled.

I am satisfied with the planned doctoral training programme.

The faculty has designed a very interested PhD program in the field of Mechatronics and Robotics.

*Budapest, 06.10.2022.*

*International Evaluator*

*Dr. habil. Gabor Kiss PhD.*