

## **The External Evaluation Report of a Doctoral Study Domain**

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

In this chapter, the following shall be summarized:

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

I was assigned with the evaluation of the Doctor Training Program at the Faculty of Mechanical Engineering. The internal evaluation was carried out using Zoom on-line platform. The meeting started on the 5<sup>th</sup> of July 2021 where ARACIS President provided to the entire team the framework of evaluation. Afterwards, there was meeting with the Rectors and Vice Rectors of the University of Craiova, the Quality Assurance Team, Faculty Academics, PhD Students, PhD Graduates and Companies recruiting PhD Graduates.

According to Art. 6 para. 3 of the Institutional Regulation for the organization and functioning of the doctoral study programs within the Doctoral School "Acad. Radu Voinea" at the Faculty of Mechanical Engineering, the members of the Doctoral School Council are elected by universal, direct, secret and equal vote of the Doctoral supervisors from the Doctoral School.

The "Acad. Radu Voinea" Doctoral School participates, through the affiliated Doctoral supervisors, in the implementation of research or institutional development / human resources grants in the field of Mechanical Engineering. After examining the Internal Self-Evaluation Report, the following meeting had been arranged with the Head of the Doctoral Training Program, Professor Daniela Tarnitan who provided very useful information.

The Faculty comprises of 9 academics. Although the Department has a research activity in Industrial Engineering, this has not been integrated in the Evaluation report. Within the evaluation period, 7 academics have been PhD academic supervisors. The research activities within the doctoral school can

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



be conducted in 3 distinct centres: INCESA, Faculty of Mechanics at both Craiova and Drobeta-Turnu Severin.

The following research labs have been established in the Department: Laboratory for testing and monitoring of materials and processes, Laboratory of advanced processing technologies, Laboratory for advanced joining technologies, Laboratory of microwave technology and advanced sensing systems. Additional research support is provided at the INCESA Research Hub of Applied Sciences research hub.

## 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.

The analysis is based on the Zoom meeting that took place online with different stakeholders (e.g. Head of the Doctoral Training Program, PhD supervisors, PhD students, PhD graduates and employers). The meeting gave the opportunity to external committee to liaise with the different stakeholders of the University. The evaluation report includes basic information regarding historical information about the Faculty, research mission and objectives, quality of the supervision and research output. The Self-Evaluation report is provided in English. However, most of the Annexes are provided in Romanian. However, the responsible team has provided assistance to understand the structure of the Doctoral school. More specifically, the following clarifications have been provided by the Faculty:

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

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

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

There is evidence where the Faculty applies broadly-accepted metrics (e.g. quantity and quality of publications, journals' quality as well as standard citation indices) to the implementation of the Doctoral program. As an effect the Doctoral program in the is deemed as good. It seems that the relatively longer graduation period and difficulties facing the job-hunting efforts of Doctoral students can be only partly attributed to an overloaded schedule of project engagement, and suboptimum career placement efforts. The Doctoral School carries out research in the following fields: Biomechanics, Biomedical engineering, Mechatronic systems with applications in medicine, Automotive, Transport optimization, composite materials, elaboration of new composite materials with hybrid matrix and natural reinforces and Energy efficiency of buildings based on renewable resources and green technologies.

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

The University has adopted a holistic approach towards administrative, management and financial planning of different Doctoral training programs.

*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.*

The Faculty of Mechanical Engineering has provided Annexes in Romanian language regarding the Internal regulations of the "Acad. Radu Voinea" Doctoral School. The Doctoral School Council includes doctoral supervisors from the Doctoral School in a proportion of maximum 50%, doctoral students in an approx. proportion of 20% and the remaining percentage is completed with members outside the Doctoral School, elected among leading scholars whose scientific activity enjoys high international recognition and / or representatives from the relevant industrial, socio-economic and professional sectors.

**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:* The regulation of the Doctoral School is described in Annex A.1.1. The description is in Romanian language.

(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.* The methodology for the election is presented in Annex A.1.1. The description is in Romanian language. There is also evidence about the people that have voted for the election of the Council.

(c) *the Methodologies for organizing and conducting doctoral studies (for the admission of doctoral students, for the completion of doctoral studies).* There is a link with a pdf file describing the organisation of the doctoral studies. The description is in Romanian.

(d) *the existence of mechanisms for recognizing the status of a Doctoral advisor and the equivalence of the doctoral degree obtained abroad.* After reading the Self-Evaluation report, there is a clear supervisor assigned to each student. This information is also linked to Annex A.1.1.1.0.

(e) *functional management structures (Council of the doctoral school), giving as well proof of the regularity of meetings;* The Doctoral students will submit to the secretariat of the Doctoral School an application for registration accompanied by a CV and a certificate issued by the Doctoral School attesting the status of student, doctoral field, year of enrolment and year of study. This process is provided in detail in Romanian in Annex A.1.1.1.2. There is no clear evidence regarding the occurrence of the meetings between the PhD student and the supervisory team.

(f) *the contract for doctoral studies;* The contract template is provided in the Annexes.

(g) *internal procedures for the analysis and approval of proposals regarding the training for doctoral study programs based on advanced academic studies.* There is procedure regarding the evaluation of the research proposals from the academics.

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* Evaluation has been carried out remotely.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* There is good procedure regarding the management of the Doctoral program. There is a need for the Faculty to use a workflow system to support transparency (e.g. meeting of the PhD student with the PhD committee).

*Recommendations:*

***There is a need to integrate within the Program, activities associated with Industrial Engineering.***

***The Department needs to align the research proposals with the research strategy.***

***The Doctoral programs need to provide training to soft-based skills (e.g. project management, presentation skills, entrepreneurship, patent filing).***

***The Faculty should make arrangements for candidates with disabilities***

***There is no process regarding the interaction among the PhD students to work in group-based projects.***

***There is a need to introduce a process to evaluate PhD progress every six-twelve months.***



***It seems that there is no process regarding the replacement of students/academic that leave the University and have been selected as members of the Council.***

***The indicator is ~~fulfilled~~/partially fulfilled/not fulfilled.***

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

*- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself-* The doctoral study programme within the "Acad. Radu Voinea" Doctoral School of the Faculty of Mechanical Engineering is organized using National education law no.1/2011. The code of doctoral studies, approved by H.G. 681/2011, with subsequent amendments and completions and MENCS Order No. 3482 of 24.03.2016. This information is described in detail in Romanian in Annex A.1.1.2 and the associated Link.

*- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself-* There is detailed information regarding the supervisor allocation, decision-making, changing supervisor, interruption conditions and research ethos and integrity.

*Recommendations:*

***-A better clear process is required regarding the allocation and even distribution of students to PhD supervisors.***

***-There is a need to utilise the Doctoral Committee to formalize PhD progress on annual basis and decision-making.***

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

***The indicator is ~~fulfilled~~/partially fulfilled/not fulfilled.***

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

The analysis is mainly based on the Internal Self-Evaluation report that it is provided in English. The Faculty has human and capital resources to support the Doctoral training program.

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

*- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The Faculty has already deployed an IT system to administer students in Cycles I, II and III. Any change in the status of the Doctoral student is recorded in the electronic records at the level of each faculty office within which the Doctoral School operates. The IT system provides statistics and generates tables with graduates of doctoral studies based on which doctoral degrees are issued.

*- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself-* The Annex A.1.2.–IM provides evidence of the IT system used to support Doctoral Program. This Annex is provided in Romanian.



*Recommendations:*

**Use of central system to record meetings between the Supervisor Team and the PhD student**

**Use of the IT system to support the alumni.**

**~~The indicator is fulfilled~~/~~partially fulfilled~~/~~not fulfilled~~.**

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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The University utilises a specialised software tool (<https://sistemantiplagiat.ro/>), which compares the text from the thesis with texts from external databases (of other users of the application). The software may indicate similarities between the verified text and the texts with which it was compared.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* It seems that a straightforward process has been used. However, there was no evidence about the similarity index of theses that have been submitted for evaluation. There is no evidence provided regarding the plagiarism output.

*Recommendations:*

**Use of anonymised samples of PhD theses to train students.**

**Use the tool to analyse the scientific manuscripts that have been written by the PhD students**

**Make clear the penalty imposed in case plagiarism detected.**

**~~The indicator is fulfilled~~/~~partially fulfilled~~/~~not fulfilled~~.**

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

The Faculty has been using state, project and internships funds to support the Doctoral 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.*

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself-* The "Acad. Radu Voinea" Doctoral School participates in the implementation of research or institutional development / human resources grants in the field of Mechanical Engineering and Industrial Engineering. Since there is limited information is provided about Industrial Engineering, the

evaluation will be based on Mechanical Engineering data. Throughout the reporting period, 9 research grants have been completed, 3 research grants are ongoing and 5 institutional grants have been completed for Mechanical Engineering. Such grants have been carried out at both national and international level.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*- Both research grants and institutional development grants have been shown that the Faculty is active to attract research grants and foster innovation. The reported information (Table A.1.3.1.1) is well above the threshold of 2 research or institutional development / human resources grants.

*Recommendations:*

**Link the research strategy and objectives with the research grants**

**Better balance the research effort between Mechanical and Industrial Engineering**

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

**Performance Indicator \*A.1.3.2.** *The percentage of doctoral students active at the time of the evaluation, who for at least six months receive additional funding sources besides government funding, through scholarships awarded by individual persons or by legal entities, or who are financially supported through research or institutional / human resources development grants is not less than 20%.*

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* According to the Self-Evaluation report, a total number of twenty-three (23) Doctoral students, have received funding from the state budget. In this period, four (4) Doctoral students have benefited from other sources of financing.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The number of students that received beneficiaries is rather small (4). This number is just below the 20% threshold.

*Recommendations:*

***Liaise with the industrial and public authorities and stakeholders to further exploit opportunities for the PhD students.***

***Increase the number of research proposals at both national and international level.***

***Provide detailed information regarding different PhD projects to demonstrate a coherence to meet research objectives.***

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

**Performance Indicator \*A.1.3.3.<sup>2</sup>** *At least 10% of the total amount of doctoral grants obtained by the university through institutional contracts and of tuition fees collected from the doctoral students enrolled in the paid tuition system is used to reimburse professional training expenses of doctoral students*

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



(attending conferences, summer schools, training, programs abroad, publication of specialty papers or other specific forms of dissemination etc.).

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself*- The Self Evaluation report provides a summary of the logistics and financial support for the training of the Doctoral students by their participation in scientific conferences and events.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*. There is lack of systematic dissemination activities throughout the reporting period. There are no training activities for the years 2017, 2018 and 2019. Surprisingly, there are some activities 2020, despite the lockdown due to the pandemic.

*Recommendations:*

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

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

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

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

The Faculty provides satisfactory environment regarding research facilities, equipment and infrastructure and access to scientific databases so that the PhD students can carry their PhD projects.

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

The research activities within the doctoral school can be conducted in 3 distinct centres: INCESA, Faculty of Mechanics (Craiova and Drobeta-Turnu Severin).

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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself*- The Annex A.2.1.1.1 -IM provides information about infrastructure that could be used for research. Examples of such specialised equipment includes hybrid/CT ultrasound imaging, medical robots, electromagnetic tracking system, CNC machines supported by R&D software (e.g. Matlab, Cimatron).

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*. By analysing the information provided (e.g. research leaflet ), it is evident there is high quality infrastructure to support applied research and experimentation in the research community.





*Recommendations:*

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

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

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

*There is enough information in the Self Evaluation Report regarding the human resources. The resources seem to be satisfactory by taking into account the PhD students' cohort.*

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

*There are twelve (12) academics, 11 at the Professorial level and 1 at the Associate Professorial level that have proven experience to carry out research in the field. Nine (9) academics carry out research in the area of Mechanical Engineering and three (3) carry out research in the area of Industrial Engineering.*

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

*- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* This indicator meets the threshold requirements. The Faculty has provided the minimum number of required advisors.

*- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The analysis should consider both Industrial Engineering and Mechanical Engineering. It is not clear why the Faculty has considered Mechanical Engineering for the Self-Evaluation. More information is expected to be provided in the Self Evaluation Report to determine the algorithm for the calculation of A1, A2 and A3 metrics for each academic.

*Recommendations:*

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

**More resources are required to support Industrial Engineering so that the involved academics meet the CNATDCU criteria.**

***The indicator is fulfilled/partially fulfilled/not fulfilled.***



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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself-* Out of nine (9) supervisors in Mechanical Engineering, 8 are full-time teaching staff members of the IOSUD. There is no information provided in the report for the academics carrying out research in the area of Industrial Engineering. Information is provided in Annex A.3.1.2.-IM in Romanian.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself-* There is sufficient number of academics that can support the PhD students. The workload distribution is not even. The number of PhD academics is rather small and this number is not enough to support all research areas that have been identified by the Faculty.

*Recommendations:*

**Strengthen the research area of Industrial Engineering.**

**Reduce the number of research areas.**

**Engage with Mechatronics and Robotics Faculty.**

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The Self-Evaluation report provides a short summary of the skills of the academics. More detailed information is provided in Annex A.3.1.3.-IM that it is in Romanian. From the CVs of the academics, it seems that they have the expertise to deliver the planned training program.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself-* It seems that the Mechanical Engineering research is solid with tangible outputs. The different research directions are not very clear. Some information can be retrieved from INCESA web site. There are interested research activities in the areas of automotive industry, material testing, ultrasound imaging and bioengineering. Through the interaction with the PhD students, the Doctoral program provides the same courses as the Master program. There is no mechanism to check the fact that a PhD student may repeat a course during the Doctoral program. The method of evaluation is not focussed on critical analysis and preparation of the PhD students to write scientific reports. The material for the courses should be mainly scientific papers from high-impact journals and conferences. The evaluation of the curriculum is not very clear.

*Recommendations:*

**Revise course curriculum using latest research papers. Use coursework in each module as a method of assessment**

**Link the research strategy with the research facilities**



### **Use the facilities to provide consultancy services to companies**

**The indicator is ~~fulfilled~~/partially fulfilled/~~not fulfilled~~.**

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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself-* Accordingly to Table A.3.1.4.1., only one doctoral supervisor out of the 12 coordinates 9 doctoral students in total during three academic years. Therefore, this criterion is met.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself-* There is sufficient number of academics that supervise the PhD students. There is only one academic that has supervised more than 8 students in the reporting period. There number of PhD students supervised per academic is not balanced.

*Recommendations:*

### **Engage in a systematic manner all academics in the supervisor process**

**The indicator is ~~fulfilled~~/partially fulfilled/~~not fulfilled~~.**

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

*The Academics of the Faculty have experience of carrying out research with outcome presented and published at both national and international level in journals and conferences.*

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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself-* Table A.3.2.1.3 outlines the results of this evaluation for the field of Mechanical

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



Engineering. This table is linked with Annex A.3.2.1.-IM that is in Romanian language. The first component P1 is linked with relevant publication results while the second component P2 refers to the Visibility in the scientific world.

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself- While the first component under evaluation is fully met at 100%, the second component is just above the required threshold of 55.55%.

*Recommendations:*

**The Department needs to adopt strategy to improve the visibility of the academic staff whose P2 criterion is below 10.**

**The indicator is fulfilled/~~partially fulfilled~~/~~not fulfilled~~.**

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

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself- Table A.3.2.2.1 indicates the total scores obtained by the doctoral supervisors in the period 2016-2020. This table is linked with Annex A.3.2.2.-IM that is in Romanian language. This table indicates the accumulation of at least 25% of the score required by the minimum CNATDCU standards in force at the date of the evaluation.

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself- Table A.3.2.2.1 indicates that all Academic staff are research active and meet the criteria of CNATDCU.

*Recommendations:*

**The Faculty must provide incentives for academics with low score to improve their performance.**

**The indicator is fulfilled/~~partially fulfilled~~/~~not fulfilled~~.**

## **Domain B. EDUCATIONAL EFFECTIVENESS**

The Faculty has organised a number of taught courses at the first year of the program. It seems that all these courses overlap with the Master program. There is a research plan with an objective to carry out training in the context of internship, research project and secondment opportunities.

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

*The vast majority of the PhD candidates have graduated from the University of Craiova.*



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 Doctoral School "Acad. Radu Voinea", has been trying in the last period of time, to attract candidates that have completed their Master's programme from other universities/academic institutions. However, it seems that the vast majority of the PhD candidates have graduated from the same University.

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

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself- Table B.1.1.1.1 shows the dynamics of the doctoral admission candidates per academic year. In the last 5 academic years, the average ratio between the number of candidates and the number of budgeted places that is higher than the required threshold:  $1.52 > 1.2$ . The percentage of the number students that have registered in the PhD programme and have graduated from other higher education institutions is 0.125.

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself. It seems that the major intake includes students that they have graduated from the Master programs from the same University. There is a need to define a clear strategy so that graduates from other Universities exposure of the Program and its research results can be better presented by improving Web site information.

*Recommendations:*

**Improve the openness to attract students from other Universities**

**Competitive advantage of the Doctoral Program and its link with industrial partner must be highlighted**

**Improve the information of the web site in both English and Romanian**

**Use of social media to promote research outputs**

**Use alumni to attract new students**

**The indicator is fulfilled/~~partially fulfilled~~/not fulfilled.**

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

The process regarding admission, monitoring and evaluation seems to be transparent.

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



- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself*- The admission uses a variety of criteria considering the academic performance of the candidates (bachelor's average grade - for candidates who graduated before the Bologna Process, Master's average grade), research framework and development plan presentation evaluation by the PhD supervisor(s) and interview where the admission committee evaluates the professional knowledge of the candidate.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself*- The knowledge of English language is not considered as a criterion, since most scientific publications in the courses should be in English. The overall process seems to be transparent. There are no special arrangements for DDS students.

*Recommendations:*

**English knowledge (speaking and writing) is essential. Certification such as IELTS should be considered in the admission process.**

**Special arrangements should be considered for DDS students.**

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* Table B.1.2.1.1. summarizes the evolution and the expelling rate of the doctoral students in the field of Mechanical Engineering. Throughout the years, the expelling rate is below the cut-off point of 30%.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The expelling rate varies over the years. The report does not explain the reasons for these dropouts (e.g. skills, financial, personal reasons). The Faculty needs to provide support to students that face different challenges throughout the PhD studies. There may be a need to formalise the progress of the students on annual basis.

*Recommendations:*

**Analyse the expel rate and provide mechanism to reduce it.**

**Provide extra support to students that have failed in the first attempt.**

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

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



The program offers a variety of training activities including courses, secondment in another peer institution, conference and events participation, papers published in international journals and internships in companies.

*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 curriculum provides training to different technical topics in the field of Mechanical Engineering as well as training on academic integrity.

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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The curriculum of the first year of training for Doctoral students (It is provided in Annex B.2.1.1 in Romanian) has been designed to enhance simultaneously technical and transversal skills. The curriculum includes the following:

- Subjects that develop technical skills (a compulsory course focusing on digital evaluation methods of technical phenomena specific to mechanical engineering and two optional, specialized subjects specific to the research topic (e.g. Biomechanics, Optimization of mechanic systems, Advanced Composite materials etc).

-Subjects that enhance various transversal competences-a compulsory course allowing for the in-depth study of the research methodology and a compulsory course designed to strengthen ethical behaviour in science.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The curriculum includes a diversity of technical courses as well as important courses related to research methods and academic integrity. The learning outcomes of each course are not clear. It is not clear whether students study scientific papers in the English language. The same applies to the evaluation of each course and the process to handle failures. Do the students have to do resit exams within the same year? What happens if students fail in more than 1 more module? Is there any interruption process? Looking at the statistics, it is very challenging to finish the program within 4 years of study.

*Recommendations:*

**Introduce rules regarding progression in the courses that are attended in the first year.**

**Coursework must be one of the components for evaluation.**

**Introduce a compulsory module related to innovation management (patent filing, research commercialisation route, spin-off and start-up process).**

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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



- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself. Doctoral students in the first year attend the Ethics and academic integrity course, dedicated to ethics in scientific research and intellectual property delivered by a Doctoral supervisor from the doctoral field of Law (Doctoral School of the Faculty of Law), within the IOSUD, Prof. Gabriel OLTEANU, PhD.

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself. The curriculum includes important topics related to ethics, plagiram and academic integrity.

*Recommendations:*

**Define the course evaluation for the Ethics.**

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself. The doctoral study programmes within the “Acad. Radu Voinea” Doctoral School ensure, through the approved curriculum, the development of professional skills (content, cognitive and research) in the field of Mechanical Engineering, as well as transversal skills. Table Annex B.2.1.3.1- IM provides more information about the curriculum, lecture material roadmaps and references/bibliography. Google classroom has been used for the on-line management of the course.

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself- It is not clear how critical thinking and analysis is embedded in the teaching methodology. There is also a questionnaire that is used to get feedback from students regarding their experience. It is not clear and there is no evidence how this feedback is used to improve training delivery.

*Recommendations:*

**If students are assessed on examination papers, moderation must be applied to exam specifications and marking.**

**Critical Thinking and research independence methodology must be embedded in the training.**

**A systematic approach on internship opportunities and training roadmap must be defined for each PhD student.**

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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<sup>5</sup> Or by what the graduate should know, understand and to be able to do, according to the provisions of the Methodology 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.





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

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself- The collaboration between the PhD students and the supervisors is reflected from theoretical developments and experimentation, as well as collaboration for the development of scientific papers and articles, patent applications (Annex B.2.1.4.2-IM) and innovations (Annex B.2.1.4.3-IM). The report does provide clear information regarding the feedback that students receive from the meetings and the mentoring support.

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself. The Annexes indicate that the supervisors meet their PhD students to contribute to theoretical and scientific innovation. However, there is limited information regarding the meetings, the topics of discussion and action points.

*Recommendations:*

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

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself. Within the field of Mechanical Engineering, 23 doctoral students are currently enrolled. The ratio is  $23/9 = 2.55 < 3$ .

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself. The Faculty has enough resources to support the PhD students.

*Recommendations:*

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

*The evaluation has been carried out taking into account doctoral students activities (training and internships) and research output per student.*

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

The Self-Evaluation report presents a good overview of the results from the PhD Students in terms of presentations, paper published, research project participation, internship engagement and event training.

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

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself. This is a very challenging task to read and evaluate the following randomly selected 5 research papers.

- Rădoi, A.I., Mirițoiu, C.M., Bogdan, M., Bolcu, A. and Geonea, I., 2020, December. Mechanical properties determination for a hybrid sandwich bar reinforced with steel wire mesh. In IOP Conference Series: Materials Science and Engineering (Vol. 997, No. 1, p. 012030). IOP Publishing.
- Tarnita, D., Georgescu, M. and Tarnita, D.N., 2016. Application of Nonlinear Dynamics to Human Knee Movement on Plane and Inclined Treadmill. In New Trends in Medical and Service Robots (pp. 59-73). Springer, Cham.
- Tarnita, D., Georgescu, M., Geonea, I., Petcu, A. and Tarnita, D.N., 2019. Nonlinear analysis of human ankle dynamics. In New Trends in Medical and Service Robotics (pp. 235-243). Springer, Cham.
- Matei, L., Dumitru, I., Oprica, A., Racila, L., Florescu, B., Dima, A. and Racila, M., 2018, June. Studies on determining the dynamics of public transport based on interdependent passengers-reconfiguration of stations. In AMMA 2018.
- Patru, E.N., Craciunoiu, N., Panduru, D. and Bica, M., 2018, June. Study on cutting temperature and surface roughness during the milling process of aluminium alloys. In IOP Conference Series: Earth and Environmental Science (Vol. 172, No. 1, p. 012018). IOP Publishing.

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself. The selected papers include original contributions. The conferences have been presented in international journal that have peer review process. The selected publications are recognized internationally.

*Recommendations:*

**There are many research outputs that are published in national venues and journals. The Faculty must define a strategy so that the research outputs become internationally excellent.**

**The indicator is fulfilled/partially fulfilled/not fulfilled.**

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

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself. Table B.3.1.2.1 presents the list of doctoral students attending events and international conferences at both national and international level, which are internationally recognised. The requested metric has been met.



- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself. Students have been presented their research outcome in events and conferences that are internationally recognised.

*Recommendations:*

**The Faculty must adopt a strategy where at least (1) output that can be presented in international excellent events that are supported by scientific organisations such as Institution of Mechanical Engineers and Institute of Electrical and Electronic Engineers.**

**~~The indicator is fulfilled/partially fulfilled/not fulfilled.~~**

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

The Faculty is engaged with academics from other national institutes for the defence of PhD theses.

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

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself. Table B.3.2.1.1 from Self Evaluation report summarizes an evaluation performed to highlight the number of participations of the members of the thesis defence committees during a year, in the reporting period.

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself. The results of this evaluation highlighted the fact that the academics taking part in the Thesis defence committees did not exceed 2 participations for the theses coordinated by the same doctoral supervisor in one year.

*Recommendations:*

**~~The indicator is fulfilled/partially fulfilled/not fulfilled.~~**

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

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself. Table B.3.2.1.1 summarizes the evaluation performed highlighting the number of participations of the members of the Thesis defence committees during a year, in the reporting period. Only one reviewer in the Thesis defence committees (1 out of the 19) recorded a ratio higher than 0.3 (Annex B.3.2.2.-IM).



- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself. There is only one reviewer/evaluator that does not meet the criteria.

*Recommendations:*

**The Faculty must keep track of the defence committees so the criterion is fulfilled.**

**The indicator is ~~fulfilled~~/partially fulfilled/not fulfilled.**

## **Domain C. QUALITY MANAGEMENT**

There is an internal quality management system that has been used for the monitoring and performance evaluation of the PhD students.

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

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

The Faculty has used a reasonable and realistic processes in terms of admission, rules and expectations and monitoring of the activities associated with the PhD students. Such processes are provided centrally by the University and has been adopted by the Faculty.

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

*(a) the scientific work of Doctoral advisors;*

*(b) the infrastructure and logistics necessary to carry out the research activity;*

*(c) the procedures and subsequent rules based on which doctoral studies are organized;*

*(d) the scientific activity of doctoral students;*

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

*(f) social and academic services (including for participation at different events, publishing papers etc.) and counselling made available to doctoral students.*

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself. The University evaluates and monitors all the Doctoral Schools centrally. More information is provided in ANNEX C.1.1\_Internal evaluation. The management and monitoring procedure and Quality Assurance Code is given in Annexes C.1.1.0 and C.1.1.1.

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself. The University has taken measures to enhance the engagement of the supervisory team. It is not clear how the KPIs (number of published, feedback from students, optimisation of resources in the research labs) are used to improve the training delivery.

*Recommendations:*

**Feedback is required in the methodology presented in Fig. C.1.1.1 to improve Doctoral training.**



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

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

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

*- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* In order to evaluate the degree of satisfaction of Doctoral students regarding the quality of the programme, an anonymous questionnaire for student evaluation of the Doctoral School, advanced university and scientific research programmes was developed, accompanied by instructions. The questionnaire mentioned above requests the opinion of the Doctoral students regarding the first year of doctoral studies, the questions referring mainly to the teaching activities developed within the University Programme of Advanced Training (PPUA) and aiming at "the learning outcomes" - the competencies, skills and attitudes that Doctoral students should develop. The data collected using the electronic system are analysed by the IOSUD-UCV Office using appropriate quantitative and qualitative tools and further processed to generate an annual report on the degree of satisfaction of Doctoral students at the IOSUD-UCV level. The report was analysed in the CSUD meeting. Since there is no detailed information about the questionnaire, it is difficult to provide comments about the type of questions. It is not clear how students' feedback is used to improve the training program.

*Recommendations:*

**Use a systematic approach so that students' feedback is used to enhance the Doctoral training program.**

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

There is information on the Web site of the Faculty regarding the Doctoral training program and the expectations from the PhD students. There is also enough support regarding the learning resources through access to important scientific databases.

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

Most of the information on the Web is presented in Romanian. After interacting with the Faculty members and the PhD students, there are some events organised where the PhD program is presented to the Master students.



**Performance Indicator C.2.1.1.** The IOSUD publishes on the website of the organizing institution, in compliance with the general regulations on data protection, information such as:

- (a) the Doctoral School regulation;
- (b) the admission regulation;
- (c) the doctoral studies contract;
- (d) the study completion regulation including the procedure for the public presentation of the thesis;
- (e) the content of training program based on advanced academic studies;
- (f) the academic and scientific profile, thematic areas/research themes of the Doctoral advisors within the domain, as well as their institutional contact data;
- (g) the list of doctoral students within the domain with necessary information (year of registration; advisor);
- (h) information on the standards for developing the doctoral thesis;
- (i) links to the doctoral theses' summaries to be publicly presented and the date, time, place where they will be presented; this information will be communicated at least twenty days before the presentation.

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself. The rules of operation of the Doctoral School are provided in Annex A.1.1.2. Regulations for admission to the third cycle of doctoral programmes are given in Annex C.2.1.1.4. The doctoral contract is given in A.1.1.1.0. The content of the program is given in Annexes B.2.1.1.-IM and B.2.1.3.-IM. The web page of the "Acad. Radu Voinea" Doctoral School has a section dedicated to brief presentations of the Doctoral supervisors, highlighting individual areas of interest and the main research topics. The web site List of Doctoral students in the school includes basic information (year of enrolment; doctoral supervisor).

- analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself. The Faculty has provided all the requested information. Further analysis cannot be done since the information is in Romanian.

*Recommendations:*

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

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

Overall, I have been given information that the Faculty provides the appropriate resources to students to carry out their research activities.

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

- description of the facts, the findings from the assessed institution's documents and the evaluation visit itself. The Faculty has provided the appropriate resources to the PhD students. This includes individual training (where specific support involves access to the literature, tutorials and advice from the Advisory committee and the supervisor, etc.), basic and applied research resource (where



support involves research facilities, modern equipment, access to specialized literature and advice from the Advisory committee and the supervisor, etc.).

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The Faculty provides sufficient resources to the students.

*Recommendations:*

***The indicator is fulfilled/~~partially fulfilled~~/not fulfilled.***

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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The University ensures the verification of the authenticity and originality of doctoral thesis and other scientific papers. IOSUD - University of Craiova uses a dedicated software, <https://sistemantiplagiat.ro/>, where the thesis is directly compared with texts from external databases. It can signal similarities between the verified text and the texts with which it was compared.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* It is very positive that plagiarism/academic misconduct is managed centrally. This policy must be extended to scientific manuscripts.

*Recommendations:*

**Apply plagiarism investigation to scientific manuscripts that are submitted for publication.**

***The indicator is fulfilled/~~partially fulfilled~~/not fulfilled.***

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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* As described in Section B, the students have access to state-of-the-art labs that could be used for the research experimentation. The access of Doctoral students to these facilities is unrestricted, but a well-established schedule with the Doctoral supervisor has been established. In these laboratories, Doctoral students are assisted by an engineer or technician, who facilitates the operation of various equipment.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The quality and quantity of the research infrastructure is sufficient to support the research activities of the students.

*Recommendations:*

***The indicator is fulfilled/~~partially fulfilled~~/not fulfilled.***

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



To enhance internationalization, the University collaborating with embassies, Fulbright organizations, AUF, British Council, French Cultural Institute, Goethe Institute and "Cervantes" Institute.

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

There is a clear strategy of the University to enhance its Internationalization. There are few events organised annually where attendees from abroad participated. However, not enough evidence has been provided regarding joint research programs and collaborative post-doc research.

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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The University has established ERASMUS+ partnership agreements with 63 universities from 24 Universities (Annex C.3.1.1. - IM) including doctoral student mobility. There are 21 Doctoral students participated in winter schools. The aforementioned criteria have been met. Annex C.3.1.3- IM lists the participation of Doctoral students in the field of Mechanical Engineering within the "Acad. Radu Voinea" Doctoral School in international conferences held abroad.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* Most of students have participated in events and training schools at both national and international level. I would suggest to define a KPI so that each student must participate at least in 1 event during the three years.

*Recommendations:*

**Define a KPI regarding participation in events and winter/summer schools**

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* Table C.3.1.2.1 provides a list of Professors that have been invited to give lectures at the Doctoral School "Acad. Radu Voinea".

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* There is a large of invited talks during 2020 (probably the talks were carried on-line). There are sporadic talks of lectures in the period 2013-2019. The Faculty needs to define a strategy to organize guest lectures in a systematic manner and liaise with Institute of Mechanical and Electrical and Electronic





Engineers. The University should exploit ERASMUS agreements so that peer academic from the collaborative institutions give guest lectures to the students.

*Recommendations:*

**Define a strategy to organise guest lectures in a systematic manner**

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

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

- *description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* There are three papers through the collaboration with peer academics from national and international institutions.

- *analysis of the facts, the findings from the assessed institution's documents and the evaluation visit itself.* The collaboration with international experts has been carried out on ad-hoc basis. There is one collaboration from an academic from abroad that is verified through a joint publication. There is a need to provide a strategy to establish this collaboration in a more systematic manner. There is no defined strategy to attract international students.

*Recommendations:*

**Define a strategy to attract international students**

***The indicator is fulfilled/partially fulfilled/not fulfilled.***

#### IV. SWOT Analysis

<p><b><u>Strengths:</u></b></p> <ul style="list-style-type: none"> <li>- Modernisation of the curriculum.</li> <li>- Industrial collaboration with industrial partners</li> <li>- Investment in building infrastructure and research equipment</li> <li>-Well-defined workflow for admission and monitoring of the PhD students.</li> </ul>	<p><b><u>Weaknesses:</u></b></p> <ul style="list-style-type: none"> <li>- The research areas are too broad in comparison with the number of academic staff</li> <li>-Lack of integration of Industrial Engineering to meet ARACIS criteria.</li> <li>-Lack of systematic collaboration with national industries and public stakeholders.</li> <li>-Few academics do not meet CNATDCU criteria.</li> <li>-Lack of a culture to establish collaboration among the PhD students.</li> <li>-Lack of clear strategy to attract foreign PhD students.</li> </ul>
<p><b><u>Opportunities:</u></b></p>	<p><b><u>Threats:</u></b></p>

<ul style="list-style-type: none"> <li>- Explore the competitive advantage of the region to attract students from the neighbouring countries (Serbia, Bulgaria).</li> <li>-Manage the innovation systematically through patent filing and</li> </ul>	<ul style="list-style-type: none"> <li>- The level financial support may not be attractive for the talented graduates who prefer to pursue PhD studies abroad.</li> <li>-The overlapping research activities with other Doctoral School poses questions regarding sustainability and the attraction of sufficient number of students.</li> <li>- Pandemic has major impact on studies and on-line teaching methodologies must be adopted.</li> </ul>
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## V. Overview of judgments awarded and of the recommendations

No.	Type of indicator (*, C)	Performance indicator	Judgment	Recommendations
1	A	A.1.1.1.	Partially Fulfilled	<ul style="list-style-type: none"> <li><i>-There is a need to integrate within the Program, activities associated with Industrial Engineering.</i></li> <li><i>-The Department needs to align the research proposals with the research strategy.</i></li> <li><i>-The Doctoral programs need to provide training to soft-based skills (e.g. project management, presentation skills, entrepreneurship, patent filing).</i></li> <li><i>-The Faculty should make arrangements for candidates with disabilities</i></li> <li><i>-There is a need for a more systematic interaction between the student and the supervisor committee (besides the Advisor).</i></li> </ul>

				<p><i>There is a need to introduce a formal process to evaluate PhD progress on annual basis.</i></p> <p><i>-There is no process regarding the interaction among the PhD students to work in group-based projects.</i></p> <p><i>-There is a need to introduce a process to evaluate PhD progress every six-twelve months.</i></p> <p><i>-It seems that there is no process regarding the replacement of students/academic that leave the University and have been selected as members of the Council.</i></p>
2	A	A.1.1.2	Fulfilled	<p>-A clearer process is required regarding the allocation and even distribution of students to supervisors.</p> <p>-There is a need to utilise the Doctoral Committee to formalize PhD progress on annual basis and decision-making.</p> <p>-There is a need to establish systematic collaboration between the Doctoral students and the other researchers within the Faculty.</p>
3		A.1.2.1		<p>-Use of central system to record meetings</p>

				<p>between the Supervisor Team and the PhD student.</p> <p>-Use of the IT system to support the alumni.</p>
4	A	A.1.2.2	Fulfilled	<p>- Use of anonymised samples of PhD theses to train students.</p> <p>-Use the tool to analyse the scientific manuscripts that have been written by the PhD students</p> <p>-Make clear the penalty imposed in case plagiarism detected.</p>
5	A	A.1.3.1	Fulfilled	<p>-Link the research strategy and objectives with the research grants</p> <p>-Better balance the research effort between Mechanical and Industrial Engineering.</p>
6	A	A.1.3.2	Partially Fulfilled	<p>-Liaise with the industrial and public authorities and stakeholders to further exploit opportunities for the PhD students.</p> <p>-Increase the number of research proposals at both national and international level.</p> <p>-Provide detailed information regarding different PhD projects to demonstrate a coherence to meet research objectives.</p>
7	A	A.1.3.3.	Partially Fulfilled	<p>-The Faculty must invest to train PhD students to attend</p>

				<p>conferences, exhibitions, summer schools and utilise open access publication fees in a more systematic manner.</p> <p>-There must be a KPI so that at least one training activity is planned for each PhD student within the 3 year periods of study.</p> <p>-The supervisory committee could monitor the students to meet these targets.</p>
8	A	A.2.1.1.	Fulfilled	<p>-The Faculty needs to obtain funds so that calibration of equipment is carried out in a systematic manner on frequent basis.</p> <p>-There is a process required within the school regarding the decision making for the purchase of the research infrastructure.</p>
9	A	A.3.1.1.	Fulfilled	<p>-The Web profile of the supervisors must provide in different tabs the following information: research area, research students, key publications and grants. Such information must be provided in both Romanian and English.</p>

				-More resources are required to support Industrial Engineering so that the involved academics meet the CNATDCU criteria.
10	A	A.3.1.2.	Fulfilled	-Strengthen the research area of Industrial Engineering. -Reduce the number of research areas. -Engage with the Faculty of Mechatronics & Robotics.
11	A	A.3.1.3	Partially Fulfilled	-Revise course curriculum using latest research papers. Use coursework in each module as a method of assessment. -Link the research strategy with the research facilities. <i>-Use the facilities to provide consultancy services to companies.</i>
12	A	A.3.1.4	Fulfilled	-Engage in a systematic manner less experienced academics in the supervisor process.
13	A	A.3.2.1	Fulfilled	Improve the visibility of the academic staff whose P2 criterion is below 10.
14	A	A.3.2.2	Fulfilled	The Faculty must provide incentives for academics with low score to improve their performance.

15	B	<i>B.1.1.1</i>	Fulfilled	<p>-Improve the openness to attract students from other Universities.</p> <p>-Competitive advantage of the Doctoral Program and its link with industrial partner must be highlighted.</p> <p>-Improve the information of the web site in both English and Romanian.</p> <p>-Use of social media to promote research outputs.</p> <p>-Use alumni to attract new students</p>
16	B	<i>B.1.2.1.</i>	Fulfilled	<p>-English knowledge (speaking and writing) is essential. Certification such as IELTS should be considered in the admission process.</p> <p>-Special arrangements should be considered for DDS students.</p>
17	B	<i>B.1.2.2.</i>	Fulfilled	<p>-Analyse the expel rate and provide mechanism to reduce it.</p> <p>-Provide extra support to students that have failed in the first attempt.</p>
18	B	<i>B.2.1.1.</i>	Fulfilled	<p>-Introduce rules regarding progression in the courses that are attended in the first year.</p> <p>-Coursework must be one of the components for evaluation.</p>

				-Introduce a compulsory module related to innovation management (patent filing, research commercialisation route, spin-off and start-up process).
19	B	<i>B.2.1.2.</i>	Fulfilled	-Define the course evaluation for the Ethics.
20	B	<i>B.2.1.3.</i>	Partially Fulfilled	-Provide references (max. 3, at least 1 in English) per weekly activity for both lecture and laboratory work. -Provide references (max. 3) per weekly activity for both lecture and laboratory work -If students are assessed on examination papers, moderation must be applied to exam specifications and marking. -Critical Thinking and research independence methodology must be embedded in the training. -A systematic approach on internship opportunities must be defined. -Learning outcomes can be achieved through coursework per course.
21	B	<i>B.2.1.4.</i>	Partially Fulfilled	An IT system is required to record the meetings, agenda and the action plan.



22	B	<b><i>B.2.1.5.</i></b>	Fulfilled	N/A
23	B	<b><i>B.3.1.1</i></b>	Fulfilled	Define a strategy so that the research outputs become internationally excellent.
24	B	<b><i>B.3.1.2.</i></b>	Fulfilled	The Faculty must adopt a strategy where outputs can be presented in international excellent events that are supported by scientific organisations such as Institution of Mechanical Engineers and Institute of Electrical and Electronic Engineers.
25	B	<b><i>B.3.2.1.</i></b>	Fulfilled	N/A
26	B	<b><i>B.3.2.2</i></b>	Not Fulfilled	The Faculty must keep track of the defence committees so the criterion is fulfilled.
27	C	<b><i>C.1.1.1.</i></b>	Fulfilled	-Feedback is required in the methodology presented in Fig. C.1.1.1 to improve Doctoral training. -Engagement of different stakeholders (e.g companies, public organisation) on the program design. -A workflow system is required for the conflict management.
28	C	<b><i>C.1.1.2.</i></b>	Partially Fulfilled	-Use a systematic approach so that students' feedback is used to enhance the Doctoral training program.

29	C	C.2.1.1.	Fulfilled	- The Academics and the Doctoral students must use their corporate email for all University activities. This important to maintain the GDPR policy.
30	C	C.2.2.1.	Fulfilled	N/A
31	C	C.2.2.2.	Fulfilled	Apply plagiarism investigation to scientific manuscripts that are submitted for publication
32	C	C.2.2.3.	Fulfilled	N/A
33	C	C.3.1.1.		-Define a KPI regarding participation in events and winter/summer schools.
34	C	C.3.1.2.	Fulfilled	N/A
35	C	C.3.1.3.	Partially Fulfilled	-Define a strategy to attract international students.
36				-Adopt a strategy where academics and students use corporate emails when sending messages to external stakeholders. This is important to be compliant with GDPR policy.

*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**

I am satisfied with the overall Doctoral training program. The Faculty has designed and implemented an interested Doctoral program in the area of Mechanical Engineering. The PhD supervisor



team has produced interested research results published at both international conferences and journals. Few weaknesses have been identified that should be considered to grow the PhD community and produce excellent scientific results.

## VII. Annexes

*The following types of documents shall be attached:*

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

17-07-2021