Annex No. 3

The External Evaluation Report of a Doctoral Study Domain

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I. Introduction[1]

In this chapter, the following shall be summarized:

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

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

The School of Doctoral Studies "Constantin Belea" appeared within the University of Craiova by regrouping in a single doctoral school the three doctoral fields of Systems Engineering, Computers and Information Technology, Mechatronics and Robotics within the Faculty of Automation, Computers and Electronics.

Currently, the doctoral field of Computers and Information Technology has 5 supervisors and 14 PhD students. The main research topics cover the following areas: Nonlinear automatics, fault-tolerant systems and real-time systems; Intelligent measurement and monitoring systems, modelling, simulation and design of electronic circuits, software tools for automatic design of microelectronic circuits; and Intelligent systems.

A total of 7 doctoral students graduated from the doctoral program in the last 5 years.

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:

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

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

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

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

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

- classrooms;
- laboratories;
- the institution's library;
- research centers;
- the Career Counselling and Guidance Center;
- lecture halls for students;
- the student residences;
- the student cafeteria;
- sports ground etc.;

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

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

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

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

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

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

- The Council of the Doctoral School, the University Senate, the Board of Directors, the Quality Assessment and Assurance Commission, the Quality Assurance Department, the Ethics Commission (including with the student representatives of these structures);
- the Career Counselling and Guidance Center;
- student organizations;
- secretariats;
- various departments/administrative offices (Social/Student residences-Cafeterias etc.);

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

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

The online meetings proceeded as scheduled with the different stakeholders: representatives of the institution and of the Council for Academic Doctoral Studies (CSUD), responsible of doctoral domain and the team who drafted the internal evaluation report, doctoral coordinators, PhD students, members of the Ethics Commission, members of the Commission for Quality Evaluation and Assurance, the Directors and persons in charge of the research centers/laboratories, Doctoral Studies Council, employers

of doctoral graduates and graduates. The meetings were moderated by the evaluation team, and attendants answered to the question raised by the members of the evaluation panel. In general, all the meeting were satisfactorily carried out and the discussion with attendants helped to clarify the different issues raised by the evaluation members.

III. Analysis of ARACIS's performance indicators

Domain A. INSTITUTIONAL CAPACITY

The doctoral school has proven to adopt the institutional framework required by legal regulations to conduct the doctoral studies. The research infrastructure is adequate to support students and supervisors and the quality of human resources is also good and over the reuiqred limits.

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

From the institutional and managerial point of view, the doctoral school covered satisfactorily all the issues related to the adoption and implementation of specific regulations for doctorate schools and enough financial and logistics resources are allocated to carry out the doctoral studies' mission. It is suggested to provide an English version for the website and the study contract.

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 "Constantin Belea" 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 of the respective university doctoral study domain:*

(a) the internal regulations of the Doctoral School;

(b) the Methodology for conducting elections for the position of director of the Council of doctoral school (CSD), as well as elections by the students of their representative in CSD and the evidence of their conduct;

c) the Methodologies for organizing and conducting doctoral studies (for the admission of doctoral students, for the completion of doctoral studies);

d) the existence of mechanisms for recognizing the status of a Doctoral advisor and the equivalence of the doctoral degree obtained abroad;

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

f) the contract for doctoral studies;

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

The general framework of the doctoral studies is defined by the IOSUD Institutional Regulation, but there is also a regulation on the organisation, operation, and internal quality assurance at the level of

the "Constantin Belea" Doctoral School. The internal regulations cover aspects such as the procedures for conducting elections for the position of Director of the Doctoral School Council (CSD), SCD members and PhD students' representatives, the organisation of doctoral studies including admission procedures, the recognition of the position of doctoral supervisor, the creation of functional management structures (Council of the Doctoral School, CSD) to coordinate the doctoral activity, the study contracts with all students admitted to the doctoral programs and the internal procedures for the analysis and approval of topic proposals.

The Council of the "Constantin Belea" Doctoral School consists of 3 Doctoral supervisors from the University of Craiova, an external member, and a PhD student.

Evidence that supports the implementation of the indicator are the general framework and internal procedures of the doctoral school, the study contract and the internal procedures that regulates different aspects related to the organization of the doctoral studies. Additionally, it has been proven that the CSD meetings are held on a regular basis, The minutes of the meetings, also provided i the supplementary documentation, includes the list of attendants, the date and the main agreements reached during the sessions.

As a recommendation, the study contract should be also available in English for possible foreign students.

The indicator is fulfilled.

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

The Regulation of the Doctoral School 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 "Constantin Belea" Doctoral School have been provided as evidence of the previous procedures.

There are no specific recommendations.

The indicator is fulfilled.

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

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

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

The Information System of the University of Craiova (EvStud) 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,

Evidence and online meetings proved that this system is working adequately.

There are no specific recommendations.

The indicator is fulfilled.

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

IOSUD ensures the verification of the authenticity and originality of doctoral theses and other research works using www.sistemantiplagiat.ro software, recognized by the National Council for Attesting the University Titles, Diplomas and Certificates (CNATDCU). 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.

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

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

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.*

Several grants and projects are leaded by PhD supervisors that belongs to the doctoral field. More specifically, there are more than 5 contracts coordinated by PhD supervisors as directors/managers with a budget of over 7,000,000 lei, being one of them ongoing. Also, there is an ongoing POCU project where several PhD supervisors are involved and PhD students in the field of Systems Engineering are amongst beneficiaries. Therefore, the indicator is accomplished.

There are no specific recommendations.

The indicator is fulfilled.

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

7 of the 14 Doctoral students benefited from sources of funding other than governmental funding, which represents the 50%. More specifically, 2 students were included in the research team of projects MOSCBIOS and TIAVIB and received funding for more than 6 months. 3 more doctoral students have benefited from QforIT grants for a period of more than 6 months and the remaining students participated in a POCU project.

There are no specific recommendations.

The indicator is fulfilled.

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

At the University of Craiova, the accounting statement of income and training costs is carried out at the level of Doctoral Schools, rather than at the level of doctoral fields. For accounting the income in the Systems Engineering doctoral field in the last 5 years, the percentage of students of the doctoral field with respect to the total of doctorate students at the school was calculated. The training costs of doctoral students consist of participation fees for attending conferences, travel expenses and internships. The estimated percentage is estimated to be 13.72%, which is above the required limit of 10%.

There are no specific recommendations.

The indicator is fulfilled.

Criterion A.2. Research infrastructure

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.

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

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

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

The main research infrastructure includes a library, access to international databases, research laboratories and computing facilities. The main laboratories at the disposal of PhD students and supervisors for teaching and research are: laboratory for modelling, identification and management of biochemical and biotechnological processes, the "industrial process control" laboratory, the "hella

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

embedded club" and "programming & numerical simulation" laboratories, the "engineering and computer aided design" laboratory, the "hydraulic and pneumatic systems" laboratory and the "control systems and equipment" laboratory. Students have also access to INCESA (Research Hub of Applied Sciences), developed within the SMIS-13845 Project and implemented between 2010 and 2016.

The research infrastructure is adequate for conducting the required research in the doctoral field and both students and supervisors are satisfied with the research facilities.

There are no specific recommendations.

The indicator is fulfilled.

Criterion A.3. Quality of Human Resources

**general description of the criterion analysis.*

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

All five Doctoral supervisors that belongs to the doctoral field of Systems Engineering fully meet the current CNATDCU minimum standards and exhibit a high level of expertise in the topics of the doctoral domain. PhD students are not fairly distributed among advisors. Although this situacion was explained to be temporary, it is advised a more even distrbution of studentes among supervisors..

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.*

All five Doctoral supervisors that belongs to the doctoral field of Systems Engineering fully meet the current CNATDCU minimum standards. 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 all doctoral advisors have a full-time employment contract for an indefinite period with the IOSUD.*

All 5 Doctoral supervisors are employed full time within the University of Craiova, 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 lecturer / CS II, with proved expertise in the field of the study subjects they teach, or other specialists in the field who meet the standards established by the institution in relation with the aforementioned teaching and research functions, as provided by the law.*

The training program has 8 specific disciplines related to the doctoral field plus two transversal disciplines about Ethics and Research Methodology. The specific disciplines are taught by the 5 PhD supervisors, which are awarded with the academic titles of Professors. The disciplines curricula are provided as part of the complementary documentation.

There are no specific recommendations.

The indicator is fulfilled.

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

The distribution of the 14 PhD students among supervisors shows that one supervisor has 10 students, whole there are other supervisors with 0 or 1 student. Although the indictor does not exceed the value of 20%, it is on the edge. During the meetings with supervisors, this situation was explained as temporary, as 3 of the supervisors have just habituated in 2019, so it is expected a more even distribution in the near future.

As a recommendation, it is suggested to better distribute PhD students among supervisors.

The indicator is fulfilled.

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

The scientific production of the 5 supervisors is considered to be adequate and over the required the minimal CNATDCU standards. Three of them show a quite good scientific publications I high ranked journals.

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.*

All 5 Doctoral supervisors in the field of Systems Engineering have more than 5 Web of Science indexed papers in high-impact Journals, most of them in Q1/Q2 quartiles. The list of publications of each supervisor is included int eh supplementary documentation and demonstrates that the scientific production and the quality of journal is clearly above the requirements of the indicator.

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

There are no specific recommendations.

The indicator is fulfilled.

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

The five supervisors achieved in the last 5 years more than 25% of the score required by the CNATDCU minimum standards. Supplementary documentation demonstrates that all of them accomplish by far this limit, being three of them over 100%.

There are no specific recommendations.

The indicator is fulfilled.

Domain B. EDUCATIONAL EFFECTIVENESS

**general description of domain analysis.*

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

**general description of the criterion analysis.*

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

The capacity if attraction of students coming from other higher education institutions is within the limits but low, so the doctoral field should try to improve these numbers.

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.*

In the period 2015-2020, 1 candidate coming from a different higher institution entered the admission contest while 5 state-subsidised places were allocated for admission to the doctoral domain. The resulting value of the indicator is then 0.2, just in the limit.

The calculation of the second ration gives 10 candidates registered for the admission exam for the 5 state-subsidised places, so its value is 2, higher than de limit 1.2.

As a recommendation, the doctoral field should try to improve the capacity of attraction of students coming from different higher education institutions.

The indicator is fulfilled.

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

The admission to the doctoral study program is clearly defined by the Doctoral School Regulations. Each applicant is individually evaluated attending to its profiles, previous studies and

average grades, publuications, awards and motivation and scientific interest. A personal interview is also conducted as part of the selection process. However, admission procedures should be visible at the doctoral school website, also in English. The procedures are adequately implemented and help to reduce the dropout rate below the required limit.

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

There is a specific procedure "evaluation criteria for admission to the doctoral studies within the "Constantin Belea" Doctoral School that defines the evaluation criteria for candidates. Admission criteria considers the previous academic achievements and average grades of previous studies, the quality and clarity of the directions proposed for the doctoral research topic, previous experience in research and/or practical activities in the last 3 years, publications and awards. There is an oral examination conducted though a personal interview. The procedure for admission is provided in the complementary documentation.

As a recommendation, admission procedures should be visible at the doctoral school website, also in English.

The indicator is fulfilled.

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

2 out of 14 doctoral students abandoned in the last 5 years, which represents a dropout rate of 11.11%, below the 30% limit.

There are no specific recommendations.

The indicator is fulfilled.

Criterion B.2. The content of doctoral programs

The training program is adequate and includes the compulsory subject about Ethics and academic integrity and Methodology of Scientific Research. However, the specific subjects' program should explicitly include the learning outcomes. Students receive a adequate guidance from advisory committees and but the human resources supporting the guidance should be increased.

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

The training program is adequate and includes the compulsory subject about Ethics and academic integrity. However, the specific subjects' program should explicitly include the learning outcomes. Students receive a adequate guidance from the advisory committee, but the teaching staff should be increased to facilitate the guidance of new students.

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

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

The Systems Engineering Doctoral Field includes 8 academic specific subjects focusing on contemporary research directions, plus two transversal subjects about Methodology of Scientific Research and Ethics and Academic Integrity. The teaching activities of the training program are carried out over a period of 14 weeks. The subjects' curricula are provided as part of the supplementary documentation. Their content is aligned with the field of the doctoral domain.

There are no specific recommendations.

The indicator is fulfilled.

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

The curriculum of the Systems Engineering Doctoral Field contains the subject of Ethics and Academic Integrity taught by Professor Gabriel OLTEANU, PhD, and member of the teaching staff at the Faculty of Law. This subject enhances transversal competences related to the notions of academic ethics in the research activity of doctoral students- The subject's curriculum is provided in the supplementary documentation.

There are no specific recommendations.

The indicator is fulfilled.

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

The disciplines' curricula are provided in the supplementary cdcumentation and contains the objectives of subject, the content and the evaluation.

As a recommendation, the disciplines' curricula should explicitly address the learning outcomes that students are expected to achieve. Currently, the include the objectives. But while objectives generally describe the desirable knowledge, learning outcomes are a more specific description of what students will be able to do in some measurable way.

There are no specific recommendations.

The indicator is fulfilled

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

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

The advisory committees is made up of the doctoral supervisors and 3 specialists, teaching or research staff members in the field of the doctoral topic. The mission of the advisory committee is to provide expert advice to the doctoral student and to participate in the evaluation of the research activity during the training programme and in the yearly defence of the research reports. Collected information from students through satisfaction questionnaires reveals that in general they are highly satisfied with the work of the advisory committee. These results were also confirmed during the online meetings with students and graduates.

There are no specific recommendations.

The indicator is fulfilled

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

Currently, 14 students are enrolled in the field of Software Engineering. The teaching staff includes 5 Doctoral supervisors in the field of Engineering Systems, 2 Doctoral supervisors that facilitate training in the transversal subjects of the training program and 3 other teaching staff. Therefore, the ratio is 2.8:1, close but below the required limit 3:1.

As a recommendation, the number doctoral supervisors and teaching staff should be increased to improve this ratio and the guidance to students.

The indicator is fulfilled.

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

Productivity of doctoral students that finished their PhD over the last 5 years is adequate, with many publications although it is suggested to target more journals with impact factor. External researchers regularly participate in the evaluation commissions.

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

Provided documentation proves that there are joint publications in journals and conferences between students and supervisors,and they are related to the topic of the doctoral field. However, it is recommended to target journals with impact factors.

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.*

7 Doctoral students graduated from the Doctoral Field in Systems Engineering in the last 5 years. All 7 of them presented papers at scientific conferences and/or published them in journals in the field, so that at least one paper per doctoral student is available. The list of students' publications is provided in the supplementary documentation. All of them fall with the topics of the doctoral field. Although the number of publications is quite high, it would be better a lower number of publications but in higher ranked journals.

As a recommendation, publications should target journals with impact factor.

The indicator is 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.*

49 presentations at international conferences were delivered by 7 graduates in Systems Engineering, resulting in a ratio of 7: 1. The complete list of publications is available through the supplementary documentation.

There are no specific recommendations.

The indicator is 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 doctoral school keeps contact with other national research groups that regularly participates in the public defense of doctoral theses. Additionally, they are distributed over the defended doctoral thesis so that the requirements are met. However, there is a frequent participation of one specialist in several evaluation panels.

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.*

The members of the doctoral theses defence committees for the 7 graduates of the last 5 academic years reveals that in any case the same external scientific referent has been appointed into more than two committees in the same academic year. However, and although the indicator is met, it was detected a frequent participation of one specialist in several evaluation panels (Prof. Radu-Emil Precup).

There are no specific recommendations.

The indicator is 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.*

The number of doctoral theses defended in the field of study is 7 in the last 5 years. As this value is lower than 10, the indicator is accomplished.

There are no specific recommendations.

The indicator is fulfilled.

Domain C. QUALITY MANAGEMENT

The Quality Assurance System is designed and implemented satisfactorily, although more emphasis on explicit action plans is advised. All the relevant information regarding the doctoral field is available through the website, but it is suggested a better organization of the information and to provide the information both in Romanian and English. The doctoral field keeps several ERASMUS agreements

with foreign institutions, but it is also suggested to improve its international visibility by including international experts in the evaluation panels.

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. However, it is suggested to keep track of actions through an explicit action plan.

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

There is a defined framework for Quality Assurance, with procedures that have been implemented. The framework includes procedures for collecting information about students and advisors, the training program and the infrastructure. There are also specific procedures to measure the students' satisfaction and some actions have been implemented. However, it is suggested to keep track of actions through an explicit action plan where deficiencies are detected and contingency plans are applied with a clear specification of the person responsible, deadline and metrics.

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

(a) the scientific work of Doctoral advisors;

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

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

d) the scientific activity of doctoral students;

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

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

The functioning of the quality assurance system within the IOSUD - University of Craiova is ensured through specific procedures at the level of all the involved structures (IOSUD, Doctoral Schools, Doctoral Fields). It includes procedures for the periodic evaluation of the PhD supervisors, the PhD students' reserach activities, the infrastructure and facilities, the organization of the doctoral programme and the social and academic support services.

Evaluation is taken periodically, and some reports are included in the supplementary documentation.

As a recommendation, the periodical reports should include an action plan where deficiencies are identified and listed, and remedy actions are proposed along with a deadline, a responsible person and the indicators to measure the evolution of the detected problem.

The indicator is fulfilled.

Performance Indicator *C.1.1.2. *Mechanisms are implemented during the stage of the doctoral study program to enable feedback from doctoral students allowing to identify their needs, as well as their overall level of satisfaction with the doctoral study program in order to ensure continuous improvement of the*

academic and administrative processes. Following the analysis of the results, there is evidence that an action plan was drafted and implemented.

Procedures for collecting information about the students' level of satisfaction have been implemented. Obtained results reveal that in general students are highly satiffied with the doctoral field. As a result of this analysis, a POCU project about the applicability of research results involving three PhD students was won and it is still ongoing.

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. However, it is recommended to unify all the information under the same domain y to provide all the information in English. Students have access to the electronic resources reñevant for the doctoral field and all the reseach facilities.

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

The links for the doctoral school regulations, admission regulations, doctoral studies contract, information for public defence of the thesis and required standards, the content of training programs, the academic and scientific profile of supervisors, list of PhD students and links to abstracts of doctoral theses to be defended publicly are provided and they contain the expected information. However, some of the links are within the doctoral website subdomain and some other within the general University of Craiova domain. For instance, admissions and public defence regulations, doctoral studies contract and links to doctoral thesis to be defended publicly should be under the subdomain http://www.ace.ucv.ro/sdcb/. The website should be also available in Romanian and English.

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

(a) the Doctoral School regulation;

(b) the admission regulation;

(c) the doctoral studies contract;

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

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

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

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

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

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

The links for the doctoral school regulations, admission regulations, doctoral studies contract, information for public defence of the thesis and required standards, the content of training programs, the academic and scientific profile of supervisors, list of PhD students and links to abstracts of doctoral theses

to be defended publicly are provided and they contain the expected information. However, some of the links are within the doctoral website subdomain and some other within the general University of Craiova domain. For instance, admissions and public defence regulations, doctoral studies contract and links to doctoral thesis to be defended publicly should be under the subdomain http://www.ace.ucv.ro/sdcb/. The website should be also available in Romanian and English.

As a recommendation, the doctoral website should be better organized including all the relevant information for student under the same subdomain and it should also be available in English.

The indicator is fulfilled.

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

Students have access to the electronic resources though international databases and the University of Craiova 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 University of Craiova have free access to the academic databases relevant in the field of Engineering Systems, such as Science Direct, Springerlink Journals, Institute of Physics Journals, Web of Knowledge (WoS, Journal Citation Reports, Derwent Innovations Index), SCOPUS and IEEE/IET Electronic Library. During the meetings with students, the accessibility of electronic resources was confirmed.

There are no specific recommendations.

The indicator is fulfilled.

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

Each PhD student has access, upon request and with the consent of the doctoral supervisor, to the Sistemantiplagiat.ro program, recognized by CNATDCU, for verifying the degree of similarity with other existing scientific works. The availability of this tool was confirmed during the meetings with students and supervisors.

There are no specific recommendations.

The indicator is fulfilled.

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

The access of PhD students to scientific research laboratories or other facilities, according to the internal regulations, is guaranteed by the doctoral study contracts. The main facilities at the disposal of the PhD students are the Library of the University of Craiova (reading rooms, book stores, including online access), the "Industrial Process Control" Laboratory " – CPI (Continental), the "Hella Embedded Club" and "Programming and Numerical Simulation" laboratories, the "Engineering and Computer Aided Design" Laboratory – IPA, the "Hydraulic and Pneumatic Systems" laboratory – SHP, the "Control Systems and Equipment" laboratory – SEC and INCESA (Research Hub of Applied Sciences) labs. Also,

upon the request of our doctoral students, access to the other laboratories of the University of Craiova is secured according to the specifics and needs of their research activities.

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

There are no specific recommendations.

The indicator is fulfilled.

Criterion C.3. Internationalization

The doctoral field keeps several ERASMUS agreements with foreign institutions and students have participated in mobilities for attending conferences or courses. Invited lecturers have also participated in the training program. However, the doctoral domain should improve its international visibility and include international experts in the evaluation panels.

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

The doctoral field keeps several ERASMUS agreements with foreign institutions and students have participated in mobilities for attending conferences or courses. Invited lecturers have also participated in the training program. However, the doctoral domain should improve its international visibility and include international experts in the evaluation panels.

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

The doctoral field keeps mobility agreements with universities and research institutes abroad that are detailed in the supplementary documentation. 7 out of the 14 Doctoral students currently enrolled have attended international conferences or training sessions, also detailed in the self-assesment report. Considering the 16 Doctoral students enrolled in the period 2015-2020, 8 of them have participated in international conferences or training sessions, which also gives a value of 50%. Supervisors have also participated in mobilities attenfing conferences or as a ERASMUS mobilities.

There are no specific recommendations.

The indicator is fulfilled.

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

Several international experts have delivered lectures and talks within the doctoral field, as detailed in the self-assessment report. . Also, special sessions are organized dedicated to PhD students and young researchers such as the Round Table session: Young Researchers Meetup in Control Engineering and Computer Science within ICSTCC 2020. There is no co-tutelage of doctoral thesis with other international higher education institution. In 2021, a workshop dedicated to the PhD students will be organized (1st

International Doctoral Workshop on Advanced Approaches in Robotics, Control and Computing) with the participation of foreign lecturers.

There are no specific recommendations.

The indicator is fulfilled.

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

The Doctoral School Council has an external member from France to intensify the internationalization activities. One foreign PhD student defended his thesis in 2018. However, the doctoral committees of thesis defended ion the last 5 years do not include international experts.

As a recommendation, the doctoral field should focus on participating in educational fairs to attract international doctoral students and included experts from international institutions in the doctoral committees.

The indicator is partially fulfilled.

IV. SWOT Analysis

Strengths:	**Weaknesses:**
- Supervisors show an adequate scientific production - The Quality Assurance Systems and Information system have been successfully implemented. - Fluid relationships between students and supervisors.	- the weaknesses identified throughout the report will be resumed as part of the indicators' analysis. Other general weaknesses that do not fall within a particular indicator may be formulated. - Admission procedures should be visible at the doctoral school website, also in English - The capacity of attraction of students coming from different higher education institutions is low - Low international visibility and low number of international contacts with other experts in the field
Opportunities:	**Threats:**
- The incorporation of recently habilitated supervisors can achieve a more even distribution of PhD students among supervisors and also increase the scientific level of the doctoral field. - There is an important automotive industry in Craiova that could be used to strength the relationships between industry and University	- The number doctoral supervisors and teaching staff is still small and should be increased to facilitate the admission of a higher number of students.

V. Overview of judgments awarded and of the recommendations

No.	Type of indicator (*, C)	Performance indicator	Judgment	Recommendations
1		A.1.1.1	Fulfilled	the study contract should be also available in English for possible foreign students
2		A.1.1.2	Fulfilled	
3		A.1.2.1	Fulfilled	
4		A.1.2.2	Fulfilled	
5		A.1.3.1	Fulfilled	
6	*	A.1.3.2	Fulfilled	
7	*	A.1.3.3	Fulfilled	
8	C	A.2.1.1	Fulfilled	
9	C	A.3.1.1	Fulfilled	
10	*	A.3.1.2	Fulfilled	
11		A.3.1.3	Fulfilled	
12	*	A.3.1.4	Fulfilled	It is suggested to better distribute PhD students among supervisors
13	C	A.3.2.1	Fulfilled	
14	*	A.3.2.2	Fulfilled	
15	*	B.1.1.1	Fulfilled	The doctoral field should try to improve the capacity of attraction of students coming from different higher education institutions
16	*	B.1.2.1	Fulfilled	Admission procedures should be visible at the doctoral school website, also in English
17		B.1.2.2	Fulfilled	
18		B.2.1.1	Fulfilled	
19		B.2.1.2	Fulfilled	
20		B.2.1.3	Fulfilled	
21		B.2.1.4	Fulfilled	
22	C	B.2.1.5	Fulfilled	The number doctoral supervisors and teaching staff should be increased to improve this ratio and the guidance to students
23	C	B.3.1.1	Fulfilled	Publications should target journals with impact factor
24	*	B.3.1.2	Fulfilled	
25	*	B.3.2.1	Fulfilled	

26	*	B.3.2.2	Fulfilled	
27		C.1.1.1	Fulfilled	The periodical reports should include an action plan where deficiencies are identified and listed, and remedy actions are proposed along with a deadline, a responsible person and the indicators to measure the evolution of the detected problem
28	*	C.1.1.2	Fulfilled	
29	C	C.2.1.1	Fulfilled	The doctoral website should be better organized including all the relevant information for student under the same subdomain and it should also be available in English
30		C.2.2.1	Fulfilled	
31		C.2.2.2	Fulfilled	
32		C.2.2.3	Fulfilled	
33	*	C.3.1.1	Fulfilled	
34		C.3.1.2	Fulfilled	
35		C.3.1.3	Partially Fulfilled	Tthe doctoral field should focus on participating in educational fairs to attract international doctoral students and included experts from international institutions in the doctoral committees

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

Several important issues raised during the evaluation are resumed and some general conclusions are drawn on the quality of the education provided within the doctoral study domain under review; the Experts' Panel also presents general assessments about the institution. Other general recommendation may also be presented, which cannot be related to a specific indicator and have not been presnted at point V.

A decision is proposed, together with the reasons for granting it (if the Experts' Panel members do not reach a consensus, each of them can propose and argue his/her own decision).

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.*