

The External Evaluation Report of “Gheorghe Asachi” Technical University of Iași Doctoral Study Programme in Environmental Engineering

I. Introduction

This report summarizes the results of periodic external evaluation of the Doctoral Study Programme in Environmental Engineering at “Gheorghe Asachi” Technical University of Iași during the 13-17 September 2021. The evaluation was conducted by the expert committee:

- Coordinator prof. univ. dr. SECUIANU Catinca, Universitatea "Politehnica" București,
- International expert prof. DSc Olav Aarna, Estonian Business School,
- PhD student Lupașcu Ana, Universitatea „Lucian Blaga” din Sibiu.

“Gheorghe Asachi” Technical University of Iași (TUIASI) is an accredited state institution of higher education and advanced research. Since its establishment in 1993, it functioned without interruption under different names. The present name dates back to 1993 and the current structure has been established through Government Decision HG 580/ 2014. TUIASI has a single interdisciplinary doctoral school with 13 doctoral study programmes in two fundamental domains: (a) engineering, (b) mathematics and natural sciences. The Doctoral Study Programme in Environmental Engineering belongs to the fundamental domain of engineering. The Programme had 26 doctoral students enrolled in 2020. The number of supervisors affiliated – 8. During the evaluation period 2016-2020 seven (7) doctoral students have graduated the Programme.

II. Methods used

The external evaluation process followed the methodology presented in the Guide on conducting the process of Periodic External Evaluation of institution organizing doctoral study programs (IOSUD). The conclusions drawn are based on:

- The analysis of the internal evaluation report of the Doctoral Domain Environmental Engineering (DDEE) and its Annexes;
- The analysis of documents, data and information available on the IOSUD/Doctoral School website, in electronic format.
- Meeting/discussions with doctoral students in the DDEE;
- Meeting/Discussions with the graduates of the DDEE;
- Meeting/Discussions with employers of the graduates of the DDEE;
- Meeting/Discussions with the officials of the DDEE;
- Meeting/Discussions with the Doctoral advisors affiliated to the DDEE;
- Meeting/discussions with the representatives of the Council of the University Doctoral Studies (CSUD), The Council of the Doctoral School (CSD), the Quality Evaluation and Assurance Commission, the Quality Assurance Department, the Ethics Commission (including with the student representatives of these structures).



III. Analysis of ARACIS's performance indicators

The analysis follows the structure of the List of the domains, criteria, standards, performance indicators and the List of critical performance indicators for the periodical external evaluation of IOSUD approved by the Order 3651 of 12.04.2021 of the Minister of Education.

Domain A. INSTITUTIONAL CAPACITY

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

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

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section II.

Performance Indicator A.1.1.1. *The existence of specific regulations and their application at the level of the DSEE:*

Specific regulations within IOSUD and the DSEE are published on the website of TUIASI (<http://www.doctorat.tuiasi.ro/>):

- a) regulation of the Doctoral School (http://www.doctorat.tuiasi.ro/doc/Regulamente/Regulament_SD_03.2021.pdf);
- b) methodology for the organisation of elections for the position of director of the Doctoral School Council (DSC), as well as for the election by the students of their representative in DSC and evidence of them having taken place (http://www.doctorat.tuiasi.ro/doc/Proceduri_Alegeri%20Director%20CSUD_CCPD_DSD/PO.CSUD_09_E1R0_Membri%20CSUD_semnata.pdf);
- c) methodologies for the organisation and delivery of doctoral studies (admission examinations for doctoral students, completion of doctoral studies): admission (http://www.doctorat.tuiasi.ro/Htm/Admiterea_2021.htm), completion of studies (http://www.doctorat.tuiasi.ro/doc/DOCUMENTE_SUSTINERE/Procedura_Anexe/Revizie%2010.2020/PO.CSUD.01%20E2R0%20Procedura%20%20sustinere%20teza.pdf);
- d) existence of mechanisms for the recognition of the capability to supervise doctoral research and for the equivalency of doctorate degrees obtained in other states (http://www.doctorat.tuiasi.ro/doc/Procedura%20echivalare%20conducere%20doctorat/PO.CSUD_03_E1R3.pdf);
- e) functional management structures (Doctoral School Council), proving also the regularity of meetings notifications (http://www.doctorat.tuiasi.ro/Htm/Componenta_CSUD-2020.htm);
- f) doctoral studies agreement (<http://www.doctorat.tuiasi.ro/Htm/Contract%20doctorat.htm>);
- g) internal procedures for the analysis and approval of propositions regarding the topics of the training programme based on advanced university studies (<http://www.doctorat.tuiasi.ro/Htm/Teme%20cercetare.htm>); the procedure of initiation, approval,



monitoring and periodic evaluation of PhD programmes (http://www.doctorat.tuiasi.ro/doc/Proceduri_diverse/PO.CSUD.13/PO.CSUD.13%20E1R0_sem_nata.pdf).

Meetings with the DDEE Council, academic staff and doctoral students confirmed the application of aforementioned regulations.

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: specific references to the way new members who are doctoral advisors are accepted; references to the mechanisms by means of which the decisions regarding the content of the training programme are made; the regulation of Doctoral School Council (DSC) with references to the procedures for the doctoral advisor's replacement; the regulation of DSC with references to the conditions under which the PhD programme can be interrupted; the regulation of DSC with references to the modalities to prevent fraud; the regulation of DSC with references to the way access to research resources is ensured. The methodology regarding attendance obligations in accordance with a methodology elaborated by the Ministry of Education has not been adopted

During the meetings the doctoral students, the members of DSC and the supervisors questioned confirmed the application of these regulations.

The indicator is fulfilled.

Performance Indicator*A.1.1.3. *Doctoral schools included in IOSUD are organized as disciplinary or interdisciplinary disciplines/thematic, according to Article 158, paragraph (7) of the Law of National Education No. 1/2011 with subsequent amendments and additions.*

TUIASI has one interdisciplinary doctoral school. Re-organizing ten doctoral schools of TUIASI in a single doctoral school was initiated through Senate decision no. 347/October 27 2017. After the validation of elections for the position of Doctoral School Director and the members of the Doctoral School Council by the TUIASI Senate on March 30, 2018, the Doctoral School started to function.

The TUIASI Doctoral School is governed by the Council for Doctoral Studies (CSUD). The CSUD subordinates 9 Doctoral Programme Coordination Councils (CCPD) established by Senate Decision on 29.10.2020 and operating at the level of the 10 faculties in TUIASI, incl. the Faculty of Chemical Engineering and Environmental Protection.

Evidence provided in the internal evaluation report and during the meetings/discussions demonstrates that the interdisciplinary Doctoral School at TUIASI is organised following the Article 158, paragraph (7) of the Law of National Education No. 1/2011 with subsequent amendments and additions, is operational and capable of fulfilling its mission.



The indicator is fulfilled.

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

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section.

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 Doctoral School keeps the doctoral students' record by its own IT system consisting of a database, and by means of the Unique Matriculation Register (UMR). Print screens are shown in Annex 2.3 of the Internal Evaluation Report.

The indicator is fulfilled.

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

Plagiarism Detector application is used (<http://www.plagiarism-detector.com/c/en/index.php>) on the basis of a contract concluded between TUIASI and Plagiat-Sistem Antiplagiat prin Internet SRL. A copy of the contract is presented in Annex 2.4 of the Internal Evaluation report together with pieces of evidence of its use.

Doctoral students met confirmed the possibility to use the aforementioned software with the permission of the supervisor.

The indicator is fulfilled.

Criterion A.2. Research infrastructure

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

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section II.

Performance Indicator A.2.1.1. The IOSUD/the doctoral school(s) present proof of possessing or having rented adequate spaces for research activity specific to doctoral studies (laboratories, experimental fields, research stations etc.).

The scientific research activities take place in the laboratories integrated in the CNCSIS-certified Environmental Engineering and Impact Assessment Research Centre (<https://erris.gov.ro/Centrul-de->



[Cercetare-Inginer-2](#) Coordinator Prof.univ.dr.eng. MariaGavrilescu), and The Analysis and Control of Environmental Factors Laboratory (<https://erris.gov.ro/www.lacmed.ro>, Coordinator Prof. univ. dr. eng. Carmen Teodosiu. Description of the available research infrastructure is presented in Annex 2.8 of the Internal Evaluation Report.

As far as the International Expert participated only in online mode there was no possibility to evaluate the situation on the spot.

The indicator is fulfilled.

Performance Indicator A.2.1.2. *The IOSUD/doctoral school(s) has/have collaboration agreements with higher education institutions, research institutes, research networks for joint partnerships and have access for using various research infrastructures; the offer for research services is presented publicly using a dedicated platform.*

Doctoral students and their advisors can benefit from Erasmus scholarships or access to COST-type programmes for the additional funding of scientific research and networking activities in order to increase the cooperation and visibility of doctoral studies in the field. Currently there are cooperation agreements with 44 universities in Europe, incl. 4 agreements on joint supervision. The possibilities provided are presented in the Doctoral School website.

Unfortunately the existence of numerous cooperation agreements has not led to joint research projects or joint doctoral programmes in the field of Environmental Engineering.

Recommendation:

Take more efficient advantage of existing cooperation agreements to initiate and become partners of joint research projects, e.g. Horizon2020, or joint doctoral programmes.

The indicator is fulfilled.

Performance Indicator A.2.1.3. *The IOSUD/doctoral school(s) proves that it is/are concerned with permanent renewal of the research infrastructure to provide doctoral students access to up-dated research resources, by applying to various funding competitions and using own university resources for acquiring new research infrastructure.*

Participation in numerous national research projects, industrial research projects and using the funds of EU funded national projects has allowed to modernise the Environmental Engineering research infrastructure.

The indicator is fulfilled.



'Criterion A.3. Quality of Human Resource

Standard A.3.1. At the level of each Doctoral School there are sufficient qualified staff to ensure a quality educational process.

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section II.

Performance Indicator *A.3.1.1. *The share of Doctoral advisors coordinating simultaneously more than 8 doctoral students but not more than 12 during their doctoral studies¹ does not exceed 20%.*

Within the DDEE there are 8 doctoral advisors. None of the advisors has more than 8 doctoral students. Evidence for the fact is presented in Annex 2.12 of the Internal Evaluation Report

The indicator is fulfilled.

Performance Indicator A.3.1.2. *At least 50% of all teaching/research staff involved in teaching/research activities related to training programs for advanced university studies or in individual research/art creation programs have a full-time employment contract for an indefinite period with the IOSUD.*

The total number of doctoral advisors in the doctoral area of study is 8. Tenured doctoral advisors in the area of study 7. The corresponding percentage is 87.5 %. The details are presented in Annex 2.10 of the Internal Evaluation Report.

The indicator is fulfilled.

Domain B. EDUCATIONAL EFFECTIVENESS

- *general description of the domain analysis.*

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

Standard B.1.1. Candidates admitted to doctoral studies demonstrate academic, research and professional performance and are diversified as social representation and by gender.

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section II.

Performance Indicator *B.1.1.1. *Admission to doctoral study programs is based on selection criteria including: previous academic, research and professional performance, their interest for scientific or*

¹ 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.



arts/sports research, publications in the domain and a proposal for a research subject. Interviewing the candidate is compulsory, as part of the admission procedure.

Admission to doctoral study programmes at TUIASI is made on the basis of the Programme selection criteria, according to the Admission Procedure (http://www.doctorat.tuiasi.ro/doc/Procutura%20admitere_02.2021.pdf). The selection criteria are specified in art. 12 and art. 13 of the mentioned procedure, and include: a foreign language test, the academic, research and professional performance of the candidates, their interest for scientific research, publications in the field and a research topic proposal. The minimum promotion grade for the admission colloquium is 7. An interview with the applicant is a mandatory part of the admission procedure. The topic and bibliography are established by each CCPD, depending on the areas managed.

In the past five years the DDEE has followed five admission criteria:

- originality and clarity of the objectives of the research topic,
- knowledge of the state of research in the field of the chosen topic,
- capacity to search and select the most relevant and recent bibliographic surveys relevant to the chosen research field,
- quality, correctness and clarity of presentation,
- capacity to answers the commission's questions in the proposed field of research.

During the evaluation the admission for academic year 2021/22 was underway following aforementioned the procedures and criteria.

The indicator is fulfilled.

Performance Indicator B.1.1.2. *The IOSUD/doctoral school(s) have a policy for stimulating enrollment of doctoral students coming from disadvantaged social environments, by allocating reserved positions in the admission procedure and/or granting special scholarships, as well as organising support programs to prevent drop-outs.*

DDEE does not have any policy for stimulating enrollment of doctoral students coming from disadvantaged social environments. During the period 2016-2020 altogether 48 doctoral students have been admitted, whereas 40 of them to the state funded study places.

During the period 2016-2020 substantial number of doctoral students have dropped out during the first two years of studies. During the same period 7 doctoral students graduated from the DDEE.

Some psychological support activities have been taken by the Doctoral School to prevent drop-outs.

Recommendation:

The DDEE should undertake more systematic analysis of the reasons for drop-out to design adequate measures to decrease the drop-out rate, and even more importantly to increase the graduation rate.

The indicator is partially fulfilled.



Criterion B.2. The content of doctoral programs

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

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section II.

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 Doctoral Programme in Environmental Engineering is based on advanced higher education studies includes an advanced training component and a scientific research one. The Programme is based on a curriculum which includes subjects aiming at a unitary approach of issues pertaining to the training of a researcher able to conduct high-level research in the context of scientific methods and to use research results in projects, publications and communications, all in accordance with the principles of academic integrity and ethics, research deontology and intellectual property rights. The curriculum is flexible, periodically updated and in keeping with the specific updates in the research area and the requirements of each cohort of doctoral students.

The Programme includes three compulsory subjects offered during the first year of doctoral studies:

- Research project management and intellectual property law (8 ECTS);
- Ethics and academic integrity (4 ECTS);
- Development of scientific materials and research ethics (8 ECTS).

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 subject „Academic Ethics and Integrity” compulsory for all doctoral students, taught by prof. Nicolae Seghedin and prof. Mariana Gavrilescu, is offered by the Doctoral School. <http://www.doctorat.tuiasi.ro/doc/Planuri%20invatamant/Planuri%20invatamant%202018-2019.pdf>.

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 activities².

The IODS established these mechanisms through the DSC, the DS regulations and the procedures drafted by DSC, where these skills are listed. In addition to the basic procedures there are also specific procedures that regulate the mechanisms by which the education programme based on advanced higher education studies associated with the evaluated area aim at learning outcomes, stating the knowledge, skills, duties and autonomy that PhD students should acquire after the completion of each subject or by conducting research. THE PROCEDURE THAT ENSURES THAT LEVEL 8 OF QUALIFICATION IS MET ACCORDING TO THE NATIONAL QUALIFICATIONS FRAMEWORK (NQF) AND THE EUROPEAN QUALIFICATIONS FRAMEWORK (EQF) CODE PO.CSUD.14 http://www.doctorat.tuiasi.ro/Htm/Legislatie_Noutati.htm and The procedure for the initiation, approval, monitoring and periodic evaluation of doctoral programmes http://www.doctorat.tuiasi.ro/doc/Proceduri_diverse/PO.CSUD.13/PO.CSUD.13%20E1R0_semnata.pdf.

The International Expert has come to a conclusion, that the concept of Learning Outcomes (LOs) has not acquired proper attention and understanding in the academic community of TUIASI.

The National Qualifications Framework of Romania describes the level 8 qualifications through the following LOs (<https://europa.eu/europass/system/files/2020-06/Romanian%20Referencing%20Report%20.pdf> pp123-124) compatible with the Bologna third cycle LOs (Dublin descriptors):

1. Knowledge, understanding and use of specific language
Systematic, advanced knowledge of concepts, research methods, controversies and new hypothesis specific to the field; communication with specialists from related fields.
2. Explanation and interpretation
Use of advanced principles and methods to explain and interpret, from multiple perspectives, new and complex theoretical and practical situations/problems that are specific to the respective field.
3. Application, transfer and problem solving
Selection and use of advanced principles, theories and methods of knowledge, transfer of methods from one field to another, interdisciplinary approaches to solve new and complex theoretical and practical problems.
4. Critical and constructive reflection
Critical-constructive assessment of projects and scientific research results, appraisal of the stage of theoretical and methodological knowledge; identification of knowledge and applicative priorities within the field.
5. Creativity and innovation
Design and undertake original research, based on advanced methods leading to the development of scientific and technological knowledge and/or of the research methodologies.
6. Autonomy and responsibility
Innovative initiation and development of complex theoretical and practical projects.

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



7. Social interaction

Assuming responsibility and capacity to organise and lead the activities of professional groups, scientific research groups or institutions.

Referencing the Programme LOs to the EQF level 8 is a very indirect way compared with descriptors provided by the Romanian NQF. Moreover, the LOs of the Programme and its components have not been presented.

Recommendations:

- 1) Provide trainings on LOs based approach and constructive alignment for the academic staff involved in the Programme.
- 2) Describe the whole Programme and individual courses in terms of expected LOs to allow better transparency, comparability and compatibility.
- 3) Use the Romanian NQF level 8 descriptors for referecing.

The indicator is partially fulfilled.

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

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

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section II.

Performance Indicator B.3.1.1. For the doctoral school there are in place mechanisms for valorification of the results of doctoral studies in accordance with the specificity of the particular domain (i.e. technological transfer, products, patents in the case of exact sciences; products and services for social sciences and humanities; festivals, contests, recitals, sports competitions; cultural-arts orders in the vocational domain; presentations ar national and international conerences, publication of research results in national and international publications, engaging doctroal students in writing research-development projects etc.)

Seven doctoral students have graduated the Programme in Environmental Engineering during the past five years. Annex 2.21 of the Internal Evaluation Report contains at least one relevant contribution for each doctoral student who defended their thesis in 2016–2020. The selection was done by the advisers.

The International Expert randomly extracted publications from Annex 2.21 and can assure their relevance and high quality.

The indicator is fulfilled.



Criterion B.4. Quality of doctoral theses

Standard B.4.1. Doctoral theses fulfil high quality standards.

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section II.

Performance Indicator B.4.1.1. *At the level of IOSUD, the percentage of theses non- validated, at the level of General Council of the National Council for Attestation of University Degrees, Diplomas and Certificates (CNADTCU), without the right of further amendments and re-organizing the process of public defending, is not exceeding 5% in the last 5 years.*

No theses at the DDEE there were non- validated at the level of General Council of the National Council for Attestation of University Degrees, Diplomas and Certificates (CNADTCU) without the right of further amendments and re-organizing the process of public defending in the last 5 years.

The indicator is fulfilled.

Domain C. QUALITY MANAGEMENT

The domain of quality management has been analysed in the context of the DDEE using resources described in section II.

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.

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section II.

Performance Indicator C.1.1.1. *The IOSUD 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 doctoral school(s), 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 academic and social services (including participation to various events, publication of papers etc.) and counselling made available to doctoral students.*



The main applicable procedure is: THE PROCEDURE FOR THE INITIATION, APPROVAL, MONITORING AND PERIODIC EVALUATION OF DOCTORAL PROGRAMMES, CODE PO.CSUD.13: http://www.doctorat.tuiasi.ro/doc/Proceduri_diverse/PO.CSUD.13/PO.CSUD.13%20E1R0_semnata.pdf. Supporting procedures: THE PROCEDURE FOR THE EVALUATION OF PHD SUPERVISORS BY THE MANAGEMENT STRUCTURES, CODE PO.CSUD.12: http://www.doctorat.tuiasi.ro/doc/Proceduri_diverse/PO.CSUD.12%20E1R0_semnata.pdf Annex PO.CSUD.13-A3 of PO.CSUD.13 contains specific details regarding the periodic evaluation process in all mentioned aspects concerning this criterion. THE PROCEDURE FOR THE ACCOMMODATION OF STUDENTS DORMITORIES: https://www.tuiasi.ro/wp-content/uploads/2020/10/PO.PRS_01_E1R5.pdf. The regulation for the organisation and running of the sports facility: <https://campus.tuiasi.ro/wp-content/uploads/ROF-Baza-Sportiva.pdf>. Access to the TUIASI dispensary. Free access to the TUIASI library: <https://biblioteca.tuiasi.ro/>. The regulation for the running and organisation of the TUIASI Center for career orientation, counselling and social inclusion <https://campus.tuiasi.ro/centrul-de-consiliere-orientare-in-cariera-si-incluziune-sociala/>. The listed procedures also establish evaluation mechanisms concerning: a) the PhD advisors' scientific activity; b) the infrastructure and logistics necessary for conducting research; c) the regulations and procedures on which the organisation of doctoral studies is based; d) the PhD students' scientific activity; e) the PhD students' education programme based on advanced higher education studies; f) the social and academic support services; g) counselling services. The social and academic support services (including regarding participation to various events, the publication of articles etc.) and counselling at the PhD students' disposal can be identified through: - professional counselling; - accommodation; - access to campus facilities; - the posting of local, national and international events regarding doctoral studies. Details regarding the implemented procedures and support services provided to PhD students are to be found in Annex 2.25 of the Internal Evaluation Report.

The indicator is fulfilled.

Performance Indicator C.1.1.2. *Students' associations and, according to the case, representatives of students organise elections in the community of doctoral students, for positions in the CSUD, by universal vote, direct and secret, all doctoral students having the right of electing or being elected.*

The Doctoral School is constantly preoccupied with the PhD students' level of satisfaction. The first questionnaire testing the level of satisfaction was distributed in 2018, followed by a series of questionnaires which included:

- The administrative services;
- The education programme based on advanced higher education studies;
- Assessment and grading;
- Communication with the PhD advisor;
- Research infrastructure;
- The scientific relationship with the PhD advisor;
- The relationship with the DSC and DS;
- The need to implement various measures;
- Other criteria.

The plan of action has been drafted and implemented as a result of the analysis of the obtained results, as described in Annex 2.26 of the Internal Evaluation Report.



The copies of filled in questionnaires provided demonstrate that the principle of anonymity has not been observed.

Recommendation:

- 1) The students satisfaction surveys need to follow the principle of anonymity.
- 2) The students need to be informed about the actions taken or planned concerning their recommendations.

The indicator is partially fulfilled.

Performance Indicator C.1.1.3. *Students' associations and, according to the case, representatives of students organise elections in the community of doctoral students at the level of each doctoral school, for positions in the councils of doctoral schools, by universal vote, direct and secret, all doctoral students having the right of electing or being elected.*

The regulation on elections for positions in the DSC stipulates universal, direct and secret vote for all doctoral students. Meeting with doctoral students confirmed that this principle is observed.

The indicator is fulfilled.

Performance Indicator *C.1.1.4. *Following the internal evaluation, IOSUD and the doctoral schools draft strategies and policies aiming to eliminate the identified deficiencies and to stimulate scientific and academic performance of IOSUD.*

The Strategic Plan 2020-2024 <https://www.tuiasi.ro/wp-content/uploads/2021/03/plan-strategic-2020-2024.pdf> sets CSUD and the Doctoral School the following objectives:

- Development of integrated study programmes in partnership with Romanian and European universities leading to the obtaining of joint degrees;
- Adaptation of doctoral studies to concrete topics, contracted and with the environment economic and social impact;
- Attracting additional funds to facilitate doctoral students periods of study abroad in order to obtain double degree;
- Facilitating the granting of scholarships by companies to doctoral students in order to be hired after graduation in the respective companies;
- Proposing new projects financed from the Structural Funds;
- Introduction of the concept of convergence in doctoral studies;
- Introduction and promotion of the European Doctorate concept;
- Continuous updating of the CSUD in order to attract as many PhD students as possible and provide information on the procedures internal affairs and events organized by CSUD.

All the objectives listed refer to important to the deficiencies in doctoral studies, particularly in the Environmental Engineering domain.

The Strategy does not contain any measurable performance indicators to evaluate the progress concerning these objectives.



Recommendations:

Complement the Strategic Plan 2020-2024 with measurable performance indicators and annual action plans.

The indicator is partially fulfilled.

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

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

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section II.

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 IOSUD/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 the training study 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) information on the opportunities for doctoral students aiming to attend conferences, to publish articles, awarding scholarships etc.*
- (j) links to the doctoral theses's 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.*

All regulations and procedures are published at the link <http://www.tuiasi.ro/rectorat/consiliul-pentru-studiile-universitare-de-doctoratwww.doctorat.tuiasi.ro>. Details and individual links can be found in Annex 2.27 of the Internal Evaluation Report.

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.

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section II.



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 have access to international databases relevant to their area of study on any computer registered in the TUIASI network through the ANELIS (National Electronic Access to the Scientific Literature for Supporting the Research and Education System in Romania) contract. The databases provide access to: Web of Science, SCOPUS, Science Direct, IEEE, Springer etc. Details and a copy of the contract are presented in Annex 2.28 of the Internal Evaluation Report.

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.*

TUIASI signed a contract of service with the 'Plagiat-Sistem Antiplagiat prin internet SRL' (Plagiarism-Anti-plagiarism System via the Internet LLC) company to check the degree of similarity. Each PhD student has access, upon request, through their PhD supervisor, to an electronic system to check the degree of similarity with other scientific works. Access is free for up to 50000 signs annually, anything exceeding this number requiring payment. Access details and payment rules are to be found in detail in Annex 2.29 of the Internal Evaluation Report.

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.*

PhD students have access to research laboratories with the endorsement of the laboratory head instructor, also mentioned by DSC regulations. Furthermore, a specific access regulation was developed considering the situation in the country starting with March 2020. Details are to be found in Annex 2.30 of the Internal Evaluation Report.

The indicator is fulfilled.

Criterion C.3. Internationalization

Standard C.3.1. IOSUD/Doctoral school has a strategy in place and it is applied to enhance the internationalization of doctoral studies.

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section II.

Performance Indicator *C.3.1.1. *IOSUD, for every doctoral school, 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.

TUIASI has 44 mobility agreements with foreign universities. Number of the DDEE doctoral students with mobilities 17. According to the Internal Evaluation Report the mobility rate is 45.95 %, which corresponds to the total number of doctoral students 37, which obviously is an average number of doctoral students during the evaluation period.

The IOSUD develops and implements policies and action plans designed to increase the number of PhD students participating in scholarships abroad up to at least 20%, the target of the European Higher Education Area. The draft strategy foresees following measures:

- the development of the Erasmus programme;
- the partnership with the platform www.phd-hub.eu;
- the set-up of summer schools for PhD students;
- the introduction of the European PhD;
- encouraging participation in programmes of the COST type;
- posting international events dedicated to doctoral studies on the website,
- scholarships in the European and non-European areas.

The details are available in Annex 2.31 of the Internal Evaluation Report.

Recommendation:

Complement the Internationalisation Strategy with measurable performance indicators and annual action plans.

The indicator is fulfilled.

Performance Indicator C.3.1.2. *IOSUD supports, including providing financial support, to the organization of doctoral studies in international co-tutelage or invitation of leading experts to deliver courses/lectures for doctoral students.*

The DDEE has 4 joint international supervision agreements. These options have not been used by the DDEE during the period 2016-2020. During the same period 30 first-rank experts held classes/lectures for the DDEE doctoral students. Details on agreements and some measures to encourage the development of cooperation with first-rank experts from the evaluated area are presented in Annex 2.32 of the Internal Evaluation Report.

Recommendation:

Using the opportunities of international co-supervision should be an important element of the Internationalisation Strategy for the forthcoming years, incl. relevant financial resources.

The indicator is partially fulfilled.



Performance Indicator *C.3.1.3. *At least 10% of the doctoral theses of every doctoral school of the IOSUD are drafted and/or submitted in an international foreign language or are organised in international co-tutelage.*

The relevant information is missing in the Internal Evaluation Report. The national database of doctoral theses (<https://rei.gov.ro/teze-doctorat>) does not provide to check this indicator either (cf. Performance Indicator C.4.1.7).

The indicator can not be evaluated.

Performance Indicator C.3.1.4. *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 committees³ etc.).*

The internationalisation of activities in the DDEE are supported by specific measures, such as:

- participation to educational fairs in order to attract international PhD students;
- the inclusion of international experts in advisory committees or PhD thesis defense committees;
- joint-supervision of theses;
- participation in international PhD defense committees;
- the establishment of the European PhD;
- the inclusion of doctoral studies in specialised European networks etc.

Details are presented in Annex 2.33 of the Internal Evaluation Report.

Recommendation:

Establish Doctoral Programme in Environmental Engineering offered in English⁴.

The indicator is partially fulfilled.

Criterion C.4. System for assurance of ethical and academic integrity

Standard C.4.1. IOSUD/Doctoral school has a functional and efficient system in place for prevention and assuring ethical and academic integrity norms.

Fulfillment of the standard has been analysed in the context of the DDEE using resources described in section II.

³ Doctoral studies are completed by presenting the doctoral thesis in public session in front of a committee whose members hear and judge the final public presentation of the thesis

⁴ TUIASI has Bachelors' and Masters' programmes offered in English. Surprisingly there are no doctoral programmes offered in English yet.



Performance Indicator C.4.1.1. *IOSUD, applies the current provisions regulating ethics, deontology/academic integrity, respectively to academic freedom and has developed:*

- *policies based on prevention regarding possible violations of the Code of ethics and academic integrity, demonstrated by public postionings, studies, analyses or measures taken;*
- *practices and mechanisms for preventing fraud, from an institutional perspective as well as from the perspective of the doctoral students;*
- *practices for preventing possible fraud in academic activity, research or any other activity, including active measures for preventing and avoiding plagiarism of any kind, as well as promoting ethical and integrity/deontology principles or observing intellectual property norms, authors' rights and other related rights, among all members of the academic community;*
- *administrative instruments which allow applying effective and eliminatory sanctions;*
- *mechanisms and measures to assure equal opportunities and protection against intolerance and discrimination of any kind;*

IOSUD monitors and permanently evaluates these practices and can prove they are applied to all activities and engagement of students in all these processes, and the results of the monitoring is made public yearly or whenever it becomes necessary.

The Ethics and Professional Deontology Committee is a component of the quality assurance framework at TUOIASI. The Committee is an autonomous entity catering to the needs of the members of the academic community upon request. Ethical references and their rules are stated in the University's Code of Ethics and in the Committee Regulation establish normative framework respectively.

Specific measures to promote professional ethics and deontology are based on the principles of academic freedom, competence and professionalism, honesty, integrity, responsibility and collegiality.

The main specific measures for the promotion of academic ethics and professional deontology are:

- The compulsory ethics class for all first-year doctoral students;
- The information provided to doctoral students by their advisors regarding ethics and deontology in their research;
- The information provided to doctoral students by their advisors regarding the research objectives, the writing of scientific papers and of the PhD thesis.

Meeting with the members of the aforementioned Committees confirmed that these provisions are operational.

The indicator is fulfilled.

Performance Indicator C.4.1.2. *All intimations regarding suspicion of plagiarism related to doctoral theses have been analysed and resolved by the IOSUD within the time interval legally established for expressing in writing its position regarding the intimation received.*

All PhD theses are checked using the plagiarism detection software and the similarity rate established. This check is accomplished on the faculty and university level. Identified similarities are analysed for plagiarism first and foremost by the supervisors.

The indicator is fulfilled.



Performance Indicator C.4.1.3. *Annual Reports of the Ethics commission of the IOSUD contain information on the stage of solving each case of intimation or own-initiative intimation regarding violation of norms or ethical aspects relevant for university doctoral studies. description of the facts, the findings from the assessed institution's documents and the evaluation visit itself.*

The Etchics Committee at TUIASI has not received any applications concerning doctoral studies during the periode 2016-2020.

The indicator is fulfilled.

Performance Indicator C.4.1.4. *The measures taken by IOSUD after the final decision of CNADTCU to withdraw the title of "doctor" following accusations of plagiarism have addressed all the aspects mentioned in CNADTCU's decision and in the current legislation.*

No such cases occurred during the periode 2016-2020.

The indicator is fulfilled.

Performance Indicator C.4.1.5. *The measures aiming to prevent academic fraud in the doctoral studies, taken by IOSUD, could be:*

- a) *Suspension of the right to advise newly enrolled doctoral students, for a period of 3 years, in the case of doctoral advisors having coordinated a doctoral thesis with a definitive decision of withdrawal of the "doctor" title for plagiarism;*
- b) *Exclusion from the IOSUD of the doctoral advisor having coordinated at least two doctoral theses with definitive decisions of withdrawal of the "doctor" title for plagiarism;*
- c) *Suspension of the right to organize the admission process of new doctoral students in the Doctoral studies domain, for a period of 2 years, if in the respective domain a doctoral thesis has been finalized and defended with a definitive decision of withdrawal of the "doctor" title for plagiarism.*

The respective regulations are presented on the web site www.doctorat.tuiasi/htm/documente%20utile.htm.

The indicator is fulfilled.

Performance Indicator *C.4.1.6. *The scientific reviewers members in the commissions for public defense of two or more doctoral theses with definitive decisions of withdrawal of the "doctor" title for plagiarism, have not been nominated in other commissions for public defence of doctoral theses for a period of at least 3 years.*

No such cases occurred during the periode 2016-2020.

The indicator is fulfilled.

Performance Indicator C.4.1.7. *IOSUD has a database open to the public containing all the doctoral theses defended in the institution beginning at least in 2016 in a format including: the domain, author,*



doctoral advisor, title of the thesis and the thesis in electronic format (if there is an agreement of the author).

Doctoral theses defended at TUJASI between 2016 and today are available in the the national public database <https://rei.gov.ro/teze-doctorat>.

The search engine of this database doesn't allow to find just all theses of TUJASI or another university. The same is searching by the name of a doctoral student or the title of his/her thesis. The search engine is expecting the whole description of the dissertation (author, title of the thesis, institution).

Recommendation:

The Ministry of Education is invited to modernise the search engine of the national database of doctoral dissertation to allow searching dissertations by university, by author or title.

The indicator is fulfilled.

IV. SWOT Analysis⁵

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|---|---|
| <p><u>Strengths:</u></p> <ul style="list-style-type: none"> • Qualified supervisors; • Well developed research infrastructure; • Motivated doctoral students. | <p><u>Weaknesses:</u></p> <ul style="list-style-type: none"> • Low participation rate in international R&D projects; • No doctoral programme in English; • Low efficiency of doctoral studies (drop-out rate, graduation rate) – unfortunately the graduation rate is not among performance indicators; • Learning outcomes based approach has not been implemented yet in doctoral studies; • Strategic management is poorly operationalised – no clear measurable performance indicators related to the strategic objectives. |
| <p><u>Opportunities:</u></p> <ul style="list-style-type: none"> • Define the strategic aim of doctoral studies and develop efficient strategy taking advantage of the strengths and addressing weaknesses; • Develop Internationalisation strategy of doctoral studies taking full advantage of the existing cooperation agreements with foreign universities. | <p><u>Threats:</u></p> <ul style="list-style-type: none"> • Limited financial support for doctoral studies, particularly doctoral scholarships, from the state; • Overly bureaucratic system for managing doctoral studies (huge number of different regulations and procedures (obviously imposed by the existing legislation)), large number of decision making bodies with partially overlapping responsibilities; |

⁵ The proposed template of SWOT Analysis does not correspond to the internationally accepted understanding of this method, where Strengths and Weaknesses correspond to the organisation under review, Opportunities and Threats correspond to the environment of this organisation.

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| | <ul style="list-style-type: none"> • Legal restrictions contraproductive for institutionalising industrial doctorates and co-supervision of doctoral students. |
|--|---|

V. Overview of judgments awarded and of the recommendations

The table below includes only performance indicators with recommendations attached. All other performance criteria are fulfilled. The performance criterion C.3.1.4 could not be evaluated because of technical reasons.

| No. | Type of indicator (*, C) | Performance indicator | Judgment | Recommendations |
|-----|--------------------------|---|----------------------------|--|
| 1 | A.2.1.2. | <i>The IOSUD/doctoral school(s) has/have collaboration agreements with higher education institutions, research institutes, research networks for joint partnerships and have access for using various research infrastructures; the offer for research services is presented publicly using a dedicated platform.</i> | Fulfilled | Take more efficient advantage of existing cooperation agreements to initiate or become partners of joint research projects, e.g. Horizon2020, or joint doctoral programmes. |
| 2 | B.1.1.2. | <i>The IOSUD/doctoral school(s) have a policy for stimulating enrollment of doctoral students coming from disadvantaged social environments, by allocating reserved positions in the admission procedure and/or granting special scholarships, as well as organising support programs to prevent drop-outs.</i> | Partially fulfilled | The DDEE should undertake more systematic analysis of the reasons for drop-out to design adequate measures to decrease the drop-out rate, and even more importantly to increase the graduation rate. |
| 3 | B.2.1.3. | <i>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</i> | Partially fulfilled | 4) Provide trainings on LOs based approach and constructive alignment for the academic staff involved in the Programme. 5) Describe the whole Programme and individual courses in terms of expected |

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|----------|-----------------|---|----------------------------|---|
| | | <i>completing each discipline or through the research activities⁶.</i> | | LOs to allow better transparency, comparability and compatibility. 6) Use the Romanian NQF level 8 descriptors for referecing. |
| 4 | C.1.1.2. | <i>Students' associations and, according to the case, representatives of students organise elections in the community of doctoral students, for positions in the CSUD, by universal vote, direct and secret, all doctoral studnets having the right of electing or being elected.</i> | Partially fulfilled | 1) The students satisfaction surveys need to follow the principle of anonymity. 2) The students need to be informed about the actions taken or planned concerning their recommendations. |
| 5 | C.1.1.4. | <i>Following the internal evaluation, IOSUD and the doctoral schools draft strategies and policies aiming to eliminate the identified deficiencies and to stimulate scientific and academic performance of IOSUD.</i> | Partially fulfilled | Complement the Strategic Plan 2020-2024 with measurable performance indicators and annual action plans. |
| 6 | C.3.1.1. | <i>IOSUD, for every doctoral school, 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</i> | Fulfilled | Complement the Internationalisation Strategy with measurable performance indicators and annual action plans. |

⁶ Or by what the graduate should know, understand and to be able to do, according to the provisions of the Methodology regarding inscription and registration of higher education qualifications in the the National Register of Qualifications in Higher Education (RNCIS) approved by the Order No.3475/2017 with subsequent amendments and additions.

| | | | | |
|---|-----------------|--|------------------|--|
| | | <i>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.</i> | | |
| 7 | C.3.1.2. | <i>IOSUD supports, including providing financial support, to the organization of doctoral studies in international co-tutelage or invitation of leading experts to deliver courses/lectures for doctoral students.</i> | Fulfilled | Using the opportunities of international co-supervision should be an important element of the Internationalisation Strategy for the forthcoming years, incl. relevant financial resources. |
| 8 | C.3.1.4. | <i>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 committees⁷ etc.).</i> | Fulfilled | Establish Doctoral Programme in Environmental Engineering offered in English |

VI. Conclusions and general recommendations

The Doctoral School and particularly the Doctoral Programme in Environmental Engineering meet most of the standards, criteria and performance indicators defined in the List of the domains, criteria, standards, performance indicators and the List of critical performance indicators for the periodical external

The International Expert has **some general recommendations concerning the external evaluation system of doctoral schools and doctoral study programmes:**

- the criteria and performance indicators need to be reformulated into more qualitative nature better supporting strategic objectives of doctoral studies, e.g. higher graduation rate;

⁷ Doctoral studies are completed by presenting the doctoral thesis in public session in front of a committee whose members hear and judge the final public presentation of the thesis



- The internal evaluation reports should be more analytical and self-critical; the present system of criteria and performance indicators implies a bureaucratic and bookkeeping oriented style of reports;
- Meetings/discussions during the site visit should be organised in a more efficient way, the number of representatives invited should be no more than 5-6 and information about the invitees should be forwarded to the expert panel members beforehand; as a rule, one person should be present in one meeting/discussion only (except the introductory and closing meeting);
- Financial aspects of doctoral studies should be better reflected in the Internal Evaluation Report, e.g. financial situation of doctoral students; analysis of the reasons for drop-out, extensions etc.;
- ARACIS should provide international experts with better overview of the wider context of evaluation, e.g. strategic development plans on the state level;
- Industrial doctorate should be clearly institutionalised;
- Co-supervision of doctoral thesis, which seems to be excluded, should be legalised;
- The Ministry of Education is invited to modernise the search engine of the national database of doctoral theses to allow searching dissertations by university, by author or title.
- Conducting the SWOT Analysis should be part of strategic management process at the university and its subdivisions, not the responsibility of the evaluators.

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