

The External Evaluation Report of a Doctoral Study Domain

I. Introduction¹

The Doctoral School for Engineering (DSE) in Reșița is under the coordination of IOSUD - Babeș-Bolyai University (UBB). Previously before merging it belonged into "Eftimie Murgu" University of Reșița (UEM Reșița). There are currently 6 Phd supervisors, 10 mentors and 9 governmentally funded doctoral students. Altogether 13 doctoral students have been successfully defended PhD in last five years in the domain (two of them in English). All doctoral theses from 2016 have been subjected to antiplagiarism verification. The basic research infrastructure in the domain of Mechanical Engineering include Centre for Vibrodiagnostics, Equipment Testing and Automation (CVDTEA); Research Centre for Hydraulics, Automation and Thermal Processes (CCHAPT); and Center for Numerical Simulation and Rapid Prototyping.

The research infrastructure is presented at the web addresses on the website of the UBB Faculty of Engineering: https://eng.ubbcluj.ro/?page_id=405. Unfortunately, in practice the Doctoral Study programme version in English cannot be found on the website of the Doctoral School.

Also, most of the SER attached documentation were in Romanian only.

Disciplines and supervisors can be found on the new website of IOSUD-UBB and Doctoral School (<https://doctorat.ubbcluj.ro/ro/sustinerile-publice-ale-tezelor-de-doctorat/>), where are also Doctoral defences publicly announced. The published thesis are available at <https://rei.gov.ro/teze-doctorat>.

The topics proposed by domain are related to industrial sector needs. Topic announced 2021 (NON-DESTRUCTIVE CONTROL OF STRUCTURE DYNAMICS) is traditional and quite overall. When meeting with supervisors, it was confirmed, that students are allowed to work in more focused directions. It is noted, that research topics are not targeting twin transition (green and digital) and circular economy related research.

When meeting with alumni, they were mostly related to academic research, but also evidence of international projects and international activity were outlined, what is positive trend. There have been also few international students, graduated successfully the domain and publishing PhD Thesis in English. The doctoral studies are conducted also in need in German, so the ability of domain to be reachable and attractive for foreign students is outstanding.

II. Methods used

The report is based upon SER, additional materials provided, and online interviews with management representatives, scientific advisors, teachers, PhD students, alumni and employers.

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



III. Analysis of ARACIS's performance indicators

Domain A. INSTITUTIONAL CAPACITY

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

**general description of the criterion analysis.*

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.

**general description of the standard analysis.*

Performance Indicator A.1.1.1. *The existence of specific regulations and their application at the level of the Doctoral School of the respective university doctoral study domain:*

(a) the internal regulations of the Doctoral School;

The IOSUD has been running doctoral school in Mechanical Engineering domain for years, it has elaborated regulations and functional council. The set of internal regulations was covering the aspects needed. The admission process was clear and topics for PhD thesis were provided openly at web page. There was mechanism for appointing Doctoral advisor. Council of the doctoral school was appointed. Doctoral students were contacted and in most cases tightly cooperating with industry. Doctoral students had possibility to publish internationally or participate in conferences and training. The yearly allowance was allocated to this (about 2020 EUR).

Recommendations: corresponding information at web page is mostly in Romanian. It is recommended to make the regulations of doctoral school available also in English. The study programme of domain is not clearly presented and the information should be clearly evident with corresponding learning outcomes.

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.*

There is functional doctoral school. The doctoral school council consists of 5 members.

Recommendations: The documentation regarding doctoral school management is recommended to be available also in English. The doctoral school misses concrete learning outcomes, also the information regarding study load in ECTS is recommended to be made available.

The indicator is fulfilled.

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



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 IT system was not checked in place, but doctoral students were informed about their status and case studies regarding process of allowing thesis to defence were present.

Recommendations: it is recommended to make doctoral study program description easily accessible in web, including optional and regular courses, corresponding credit points and learning outcomes.⁹

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.*

Means for plagiarism detection are present, doctoral students were aware of sistemantiplagiat.ro possibilities. Actually it is positive worth to mention, that the implemented system works well with Romanian literature besides English ones.

Recommendations: None

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.*

**general description of the standard analysis.*

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.*

Grants have been available for advisors.

Recommendations: The reported grants are well covering all years of DSE. Supervisors have been active and succesful in applying national and EU funding. However, it is advisable to have a dedicated funding for domain, to be spreaded by Doctoral School Council.

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%.*

As reported in SER, the indicator is filled, all 9 doctoral students are funded by state budget.

Recommendations: None

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.).*

Despite SER reflecting statistics of past, in interviews become evident, that in last year after merging the doctoral grants have been increased remarkably.

Recommendations: None

The indicator is fulfilled.

Criterion A.2. Research infrastructure

**general description of the criterion analysis.*

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

**general description of the standard analysis.*

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.*

According to SER there are modern research labs and ICT resources available. Also interviews with PhD students confirmed, that corresponding digital accesses to research literature are very good, and also possibilities to use research labs at university and partnering enterprises were granted.

Recommendations: None

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.

**general description of the standard analysis.*

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*

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.



the evaluation is carried out, which standards are required and mandatory for obtaining the enabling certification.

The supervisors have high or outstanding h-indexes, e.g. Prof Gilbert-Rainer Gillich having h-index 27, and they have positive history and high success rate in EU projects.

Recommendations: None

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.

There are altogether 3 tenured full professors and 3 associate professors.

Recommendations: None

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.

There were outlined two courses: “Methodology of research and statistical data processing” and “Ethics in scientific research and intellectual property”, where in SER was proven record of expertise of lecturers at the doctoral study programme.

Recommendations: None

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 programs³ does not exceed 20%.

The load of 4 advisors is normal due steady progress and relatively low number (9) of doctoral students.

Recommendations: The number of doctoral students is relatively low and high potential of scientific advisors could be used more thoroughly. Also, only 4 professors are active in supervising.

The indicator is fulfilled.

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

**general description of the standard analysis.*

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



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

All supervisors have minimum 5 publications indexed in WoS. The list of publications was analysed in SER, the publications have high scientific visibility reflected also in high h-index of supervisors.

Recommendations: None.

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.*

Five supervisors form six are scientifically active. There was provided evidence in SER regarding publishing activity.

Recommendations: Despite the indicator, all supervisors should be scientifically active.

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.

**general description of the standard analysis.*

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



contest within the doctoral domain is at least 0.2 or the ratio between the number of candidates within the past five years and the number of seats funded by the state budget put out through contest within the doctoral studies domain is at least 1,2.

The ratio between the number of master's degree graduates of other higher education institutions in the country or abroad who have registered for the contest for admission to doctoral studies in the last five years and the number of places financed from the state budget put up for contest in the field of doctoral studies is 0.4.

Recommendations: None

The indicator is fulfilled.

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

**general description of the standard analysis.*

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.

The admission was announced publicly at webpage <https://doctorat.ubbcluj.ro/ro/date-importante/>

Recommendations: none

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 admission⁴ does not exceed 30%.

The dropout rate was 27.3%, what is below KPI.

Recommendations: The dropout rate is still a problem, as number of doctoral students s relatively low. The domain has potential to involve more doctoral students.

The indicator is fulfilled.

Criterion B.2. The content of doctoral programs

**general description of the criterion analysis.*

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.

**general description of the standard analysis.*

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.

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



The study program includes relevant courses as “Scientific documentation and authorship”, “Research methodology and statistical data processing”, and “Ethics in scientific research and intellectual property”.

Recommendations: The study plan does not include teaching practice. It is recommended to include teaching as optional study program part to educate PhD students to be involved in academic teaching. Also, there is currently no doctoral seminar, allowing students to make presentations internally, and to discuss topics inside doctoral school.

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.

There was corresponding courses regarding ethics included: Ethics in Scientific Research and Intellectual Property. However, its learning outcome “ Creating skills related to good practice in ethics and academic integrity” is poor and does not include skills or knowledge regarding evaluation and analysing intellectual property (mostly patents and utility models, but also trade marks and industrial designs are relevant here) topics.

Recommendations: The learning outcomes regarding IP should be revised, and also the content of the course provided.

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 activities⁵.

There are learning outcomes present at course descriptions. However, the learning outcomes are not corresponding to the doctoral study level, e.g. “Formulation of the current state of research. Referencing bibliographic sources and citation mode. Presentation of the research method of the materials / techniques. Adequate presentation of the written work”.

As these are doctoral subjects, it is noticeable that in many cases the outputs are currently written in the key of lower level thinking skills and reproductive learning (ie suitable for 1st level curriculum) - know, understand, understand, have knowledge. In doctoral studies, subjects should already develop a higher level of thinking skills and productive learning, which means that students must be able to analyze, synthesize, evaluate or create new knowledge. It is very difficult to assess all kinds of knowledge and knowledge possessions, but rather the side of applying knowledge is what can be assessed using different assessment methods.

Recommendations: The study program learning outcomes could be revised to include abilities to analyze, synthesize, evaluate or create new knowledge being involved in learning outcomes.

The indicator is partly fulfilled.

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.



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.

There is no doctoral seminar in study program foreseen.

Recommendations: PhD students regular seminars should be included into study program to grant better feedback to their progress.

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.

There are currently 9 PhD students and 11 supervising researchers, so the ratio was 0.82:1.

Recommendations: None

The indicator is fulfilled.

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

**general description of the criterion analysis.*

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

**general description of the standard analysis.*

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.

There was evidence of successful defence with quality contents, doctoral students have had at least 3 scientific publications by the moment of thesis defence achieved.

Recommendations: None

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.

The ratio between the number of presentations of doctoral students who completed their doctoral studies in last 5 years and the number of doctoral students who have completed their studies is at least 1.

Recommendations: None

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.

**general description of the standard analysis.*

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 number of defence committee members having overload was in allowed limits (2).

Recommendations: None

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.

Recommendations: The scientific referees were changed in different defences.

The indicator is fulfilled.

Domain C. QUALITY MANAGEMENT

**general description of domain analysis.*

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

**general description of the criterion analysis.*

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.

**general description of the standard analysis.*

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:

The thesis defence procedure is well organised. The responsible committee members are appointed according university regulations.

Recommendations: None.

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.

The number of students is not so high, the students have several supervisors and co-supervisors and the feedback is gathered directly. There are anonymous questionnaires available.

Recommendations: None

The indicator is fulfilled.

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

**general description of the criterion analysis.*

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

**general description of the standard analysis.*

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:*

The info feed regarding domain in web platform was well described in SER, and it is also really representative in everyday use, as tested by evaluator and confirmed by PhD students during interviews.

Recommendations: the information regarding doctoral study regulation is not available in English, this should be enhanced for international visibility.

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.

**general description of the standard analysis.*

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.*

The students have access to national academic database Anelis Plus, making available restricted services as ScienceDirect, Thomson Reuters etc

Recommendations: None

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.*

-The access to digital resources/libraries is granted. In meeting with evaluators the PhD students were aware of plagiarism checking tools and the availability of sistemantiplagiat digital tool.

Recommendations: None

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 to mechanical engineering infrastructure provided by university is appropriate.

Recommendations: None.

The indicator is fulfilled.

Criterion C.3. Internationalization

**general description of the criterion analysis.*

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

**general description of the standard analysis.*

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.*

There are mobility tools through Erasmus + measure well used for mobility.

Recommendations: There was evidence of involving industrial students into doctoral study domain. However, in meeting with evaluators most of the doctoral students were not comfortable in English. It is recommended to underline Academic English as a part of doctoral study program.

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.*

There was evidence of invited top specialists and foreign professors.

Recommendations: None

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.).*

There was evidence regarding internationalization activities, the support per doctoral student per year is set.

Recommendations: None

The indicator is fulfilled.

IV. SWOT Analysis

<p><u>Strengths:</u></p> <p>Very strong supervisors with outstanding scientific visibility. Strong support and interest from local enterprises, municipalities, scientific community. Successful alumni advanced after graduation both in national and international career Need of local economy Relatively large pool of PhD students and interest to the topics proposed by study program</p>	<p><u>Weaknesses:</u></p> <p>Sometimes limited knowledge of English amongst PhD students. Study plans are individual and as such are not clearly defined with PhD level expected learning outcomes nor doctoral seminars or teaching activities. The information in web is limited to international students regarding accessibility but also overall curriculum plan.</p>
<p><u>Opportunities:</u></p> <p>Lots of active alumni not directly involved in academia yet Topic of green economy/energy and production digitalisation opens new opportunities in EU The domain has high potential to attract international students</p>	<p><u>Threats:</u></p> <p>The number of doctoral students remains low and drop out of few students might affect the domain too heavily. Without going more international and without targeted modernising of the study program towards twin transition (green&digital) the interest of young generation towards study program ends up.</p>

V. Overview of judgments awarded and of the recommendations

No.	Type of indicator (*, C)	Performance indicator	Judgment	Recommendations
1	*	C.3.1.1	In some cases became evident moderate level knowledge of English amongst PhD students	Improvement of study program to involve courses taught in English.
2	C	B.2.1.3	<i>As these are doctoral subjects, it is noticeable that in many cases the outputs are currently written in the key of lower level thinking skills and</i>	<i>The study program could be revised regarding Learning Outcomes to include abilities to analyze, synthesize, evaluate or</i>



			<p>reproductive. In doctoral studies, subjects should already develop a higher level of thinking skills and productive learning, which means that students must be able to analyze, synthesize, evaluate or create new knowledge.</p>	<p>create new knowledge being involved in learning outcomes.</p>
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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 presented 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).

Overall, the SER report was well composed and structured. The meetings with counterparts all in positive mood, supportive to the domain and the field's future. Some remarks made here and propositions are made to support the development and keeping up the quality of higher education PhD domain.

*External evaluator
Prof Tauno Otto*