



The External Evaluation Report of a Doctoral Study Domain

(prof. dr. Ajda Fošner, University of Primorska, Slovenia)

Introduction

Type of Evaluation: Periodical External Evaluation

Department: "Ovidius" University of Constanta, Doctoral study domain Mathematics

Period of the evaluation visit: 22 November – 26 November 2021

Committee: Octavian Agratini (Coordinator), Ajda Fošner (International expert), Alexandra-Maria Chiper (PhD student)

"Ovidius" University of Constanta is the largest European university at the Black Sea. Situated in Constanța, the largest city in Dobruja and South-Est Romania, the university is located in an economically powerful region, which represents a cultural bridge between East and West, an eastern gate to European Union. It offers undergraduate, master's and doctoral students from all types of studies (full-time, part-time and distance learning) a performant material basis, with modern spaces, equipped with study facilities and technological devices necessary for the didactic process, grouped in eight university buildings. Ovidius University is a comprehensive, multicultural higher education institution, with the mission to create, maintain and disseminate knowledge to the society through education, research and artistic creation at European standards. The university is actively engaged in the community, but with an impact on the entire Black Sea region, Europe, and beyond.

"Ovidius" University of Constanta is an educational institution which organizes doctoral studies since 1990. Doctoral studies are organized by doctoral fields within doctoral schools provisionally authorized to operate or accredited. The doctoral fields that are organized within IOSUD-UOC are: Philology, Theology, Biology, Medicine, Dental Medicine, History, Mathematics and Civil Engineering.

The Faculty of Mathematics and Informatics benefits from a wide variety of laboratories. It offers continuing education programs and collaboration with Universities from abroad for those interested in pursuing a career in Mathematics or Computer Science. Several European Community programs like Socrates and Tempus offer support for student exchange with other European Universities. The faculty also provides support for the professional re-conversion in areas like Enterprise Computer Management, Computers and Economics, Postgraduate didactic Informatics re-conversion, Statistics and Informatics. A limited number of scholarships are offered annually to the excellent students and those who need support.

Admission for the PhD Program in Mathematics is only possible if one of the professors in the Faculty of Mathematics and Computer Science is willing to supervise the PhD student. Due to the limited number of students who can be supervised by each professor, the admissions for the PhD Program are restricted. Possible research areas are: Algebra (adviser: Prof. Dr. Mirela Stefanescu), Analysis (adviser: Prof. Dr.



Dumitru Popa). Partial Differential Equations (advisers: Prof. Dr. Silviu Sburlan and Prof. Dr. Dan Pascali). The period of the doctoral studies at the Ovidius University of Constanta is the following: one year (2 semesters) for advanced studies and two years for research and defending the thesis. There is no objection in finalizing the doctoral program before limit. The courses offered in the first year may be changed according to the scientific interests of the PhD students.

Methods used

Before the evaluation visit we analysed:

- the internal evaluation report of the doctoral study domain under review and its Annexes (those, available in English);
- the documents, data and information available on the IOSUD/Doctoral School(s) website.

Before the evaluation visit we also had an online meeting (22 November 2021) with all evaluation panel members for instructions.

During the evaluation visit, we had the online discussions with:

- doctoral students in the doctoral study domain under review;
- employers of the graduates of the doctoral study domain under review;
- academic staff of the doctoral study domain under review;
- school officials of the doctoral school(s) in which the doctoral study domain under review is operating;
- representatives of the various structures (the council of the doctoral school, the university senate, the board of directors, the quality assessment and assurance commission, the ethics commission) of the doctoral schools in which the doctoral study domain under review is operating.

We also had a technical meeting with all evaluation panel members to identify specific issues that needed to be clarified during the evaluation. Visit of the buildings included in the institution's property was not possible for international members of the committee because of the pandemic situation and, as a consequence, the remote evaluation.

On the last day of the evaluation we had an online meeting with all evaluation panel members for conclusions and a meeting with representatives of the institution under review to discuss on the conclusions of the evaluation process and the main recommendations.

Analysis of ARACIS's performance indicators

Domain A. INSTITUTIONAL CAPACITY

A general description of the field as well as its particularities are highlighted in this section. Here we used analysis of the internal evaluation report and information available on IOSUD website.

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.

The analysis of the standard is based on the self-assessment file submitted to ARACIS as well as on the discussions held online during the visit.

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

- (a) the internal regulations of the Doctoral School;
- (b) the Methodology for conducting elections for the position of director of the Council of doctoral school (CSD), as well as elections by the students of their representative in CSD and the evidence of their conduct;
- (c) the Methodologies for organizing and conducting doctoral studies (for the admission of doctoral students, for the completion of doctoral studies);
- (d) the existence of mechanisms for recognizing the status of a Doctoral advisor and the equivalence of the doctoral degree obtained abroad;
- (e) functional management structures (Council of the doctoral school), giving as well proof of the regularity of meetings;
- (f) the contract for doctoral studies;
- (g) internal procedures for the analysis and approval of proposals regarding the training for doctoral study programs based on advanced academic studies.

Within the Organizing Institution of University Doctoral Studies (IOSUD) – Ovidius University of Constanta (OUC) the operational arrangements have been implemented as required by the specific legislation concerning the setup of doctoral studies and a set of regulations and methodologies have been enacted, as follows.

1. Internal regulations of the administrative structures:
 - The institutional regulation for the organization and functioning of the doctoral studies' programs at the OUC, adopted by Senate Decision no. 420/02.11.2017;
 - Regulation on Organizing and Functioning of the Doctoral School of Mathematics.
2. The methodology for the election of the members of the University Doctoral Studies:
 - Council (CSUD) and the Doctoral School Council (CSD), of the CSUD and CSD Directors from the Institute of Doctoral Studies of the OUC, approved by Senate Decision No. 124 from 25.04. 2016.
 - Evidence to the elections organized by the establishment of CSUD 2016-2020.
 - Evidence to the development of the contest for the employment of the CSUD director 2016-2020.
3. Schedule and results of the contest organized for the employment of the CSUD director 2016-2020.
4. Methodologies for the organization and functioning of the doctoral studies:
 - The regulation concerning the organization and functioning of the admission examination for the doctoral studies, approved by Senate Decision 53 from 05.04.2018;
 - The regulation concerning the organization of the graduation examination for doctoral studies, by publicly defending the doctoral thesis within the O.U.C. approved by Senate Decision no. 222 from 29.05.2017.
5. The recognition of doctoral supervisors and doctorate degrees obtained in other states
6. The regular operation of the management structures within CSUD/CSD sustained and evidenced by the minutes taken for each meeting and evidence for the functioning of the CSUD in last 5 academic years.
7. The contract for university doctoral studies.
8. Internal procedures for analysis and approval of the proposals concerning the subjects of the doctoral studies' programs.

Recommendations: /

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.

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Starting with the 2012/2013 academic year, doctoral studies are organized in the doctoral schools subordinated to the Doctoral Studies Institute (hereinafter referred to as ISD) of the UOC <http://www.univ-ovidius.ro/educatie/doctorat> , with the role of coordinating from the administrative point of view of doctoral studies. By Senate Decision no. 1291/5.12.2012 the names of the doctoral schools under the CSUD in which doctoral studies in 8 doctoral fields are carried out were approved. The doctoral fields, currently regulated by GD 778/2015 and organized within the ISD are: Philology, History, Theology, Biology, Mathematics, Civil Engineering and Facilities, Medicine and Dental Medicine. In 2018 by Senate Decision no. 502 of 28 June 2018 the Doctoral School of Mathematics is set up by detaching this field from the Applied Sciences Doctoral School.

The Doctoral School of Mathematics (SDMATE) is an organizational and operational structure of iOSud-uoc without legal personality, with the mission of development, implementation, monitoring and evaluation of the UOC policies in the field of doctoral studies in the Mathematics field. "Ovidius" University of Constanta has obtained the quality of institution of doctoral studies in the field of Mathematics in 1992, with 34 graduates up to 2014. In 2012, the Doctoral School of Applied Sciences was set up having in its composition the Mathematics doctoral field, where only two doctoral drivers who could not form a separate school were present at that time. In the same year, on the basis of OM 3850 art. 7 (c) the Mathematics doctoral field has entered liquidation and, although present as a field within the Doctoral School of Applied Sciences, no admission examination has not been organized in the field of Mathematics until 2015. In 2018, according to HG 778 the Mathematics doctoral domain was reinstated and started functioning again (1 PhD student in the academic year 2015-2016). Currently, SDMATE has five doctoral supervisors, tenured at UOC.

The Regulation of the Doctoral School of Mathematics was drawn up in compliance with the provisions of Article 17 al. (2) from the Code of the doctoral university studies, annex to the Governmental Decision 681/2011, as it was modified through Governmental Decision 134/2016.

- The regulation of the Doctoral School of Mathematics includes references concerning the acceptance of new doctoral supervisor members in art. 15(1) and 15(3) and regulations referring to the way in which a doctoral supervisor's membership can be revoked in article 15(9);
- The regulation of the Doctoral School of Mathematics includes, in articles 24, 25, 26, 29, as well as in Annex 3, the mechanisms by which decisions are made regarding the suitability, structure and content of the training program based on advanced academic studies;
- The regulation of the Doctoral School of Mathematics includes, in article 16, the procedures for changing the doctoral supervisor of a doctoral student and the procedures for the mediation of the conflicts;
- The regulation of the Doctoral School of Mathematics includes, in article 24 (5), the conditions in which the doctoral program can be interrupted;
- The regulation of the Doctoral School of Mathematics includes, in article 34, the ways of preventing scientific research frauds, including plagiarism;
- The regulation of the Doctoral School of Mathematics includes, in articles 17(d, f, g, h, i, j, k) and article 35, ways of ensuring access to research data;



- The regulation of the Doctoral School of Mathematics includes, in article 17(4), the attendance requirements of the doctoral students, in accordance with a methodology developed by Ministry of National Education.

Recommendations: /

The indicator is fulfilled.

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

The analysis of the standard was based on the self-assessment file submitted to ARACIS, as well as on the meetings held during the visit.

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.

In the academic year 2018/2019, OUC has purchased the Doctorate module of the integrated student information and management system UMS delivered by the firm Red Point. The new module form the UMS software is based on the managing doctoral students. This module contains information on the doctoral thesis of the student, his reports and the activities in which the student is involved. Among the general features of the module, the most important ones are: the completion of the doctoral students' records for the years in which they were not marked with qualifications, management of the grades and qualifications that the students obtain for each subject and class during the academic years, as well as information concerning the progress reports.

Recommendations: /

The indicator is fulfilled.

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

All the doctoral theses developed at the Ovidius University of Constanta starting from March 2016 have been checked for plagiarism by using a specialized software which is included in the List of softwares recognized by the National Council for Attesting Academic Titles, Diplomas and Certificates (CNATDCU), specified in OM 3485/2016. Each doctoral supervisor starts from the sequences of similarities identified by the software and decides whether there is unauthorised borrowing of content or not. Within the doctoral school of the OUC, in the period March 2016-September 31, 2018, the platform Plagiarism-detector www.plagiarism-detector.com was used.

Recommendations: /

The indicator is fulfilled.

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

The analysis of the standard is based on the documents requested by the commission during the visit because of unclear data in the self-assessment file.

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, perdoctoral



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.

Between 2017-2019 there have been 4 institutional development grants awarded by MCI and MECRSR for the journal The Scientific Annals of OUC, Mathematics series:

- 1) 2019-Grant for the journal The Scientific Annals of OUC, Mathematics series, awarded by MCI (17.703 RON), <http://www.research.gov.ro/uploads/subventionareliteratura-ts/2019/skm-bizhubc19112611370-m.pdf>
- 2) 2018-Grant for the journal The Scientific Annals of OUC, Mathematics series, L16/2018 awarded by MCI (20.036 RON), <http://www.research.gov.ro/uploads/subventionare-literatura-ts/2018/rezultateevaluare/skm-bizhubc18112709220-m.pdf>
- 3) 2017-Grant for the journal The Scientific Annals of OUC, Mathematics series, L13/2017 awarded by MCI (25.872 RON), <http://www.research.gov.ro/uploads/subventionare-literatura-ts/2017/lista-cartilor-sirevistelor-subventionate-in-anul-2017-m.pdf>
- 4) 2017-Grant for the journal The Scientific Annals of OUC, Mathematics series, ANCSI-LIT_TH-ST-2016-0003 awarded by MECST (48.000 RON), <https://www.research.gov.ro/uploads/subventionare-literatura-ts/2016/skmbizhubc16121210461.pdf>

Recommendations: /

The indicator is fulfilled.

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

In the academic year 2018-2019, a doctoral student received a study grant (874 RON/month x 12 months) from the budget of the Doctoral School of Mathematics OUC for financing the doctoral training stages. Three doctoral students received the Scholarship within the project "Academic excellence and entrepreneurial values - scholarship scheme for ensuring opportunities of training and development of entrepreneurial skills for doctoral students and graduates" in the amount of 1550 RON /month x12 months = 18600 RON. The ratio for doctoral students that have benefited from other sources of financing than the governmental one or are financially supported by research and institutional development/human resources grants is of $4/16 = 25\%$ (not less than 20%).

Recommendations: /

The indicator is fulfilled.

Performance Indicator *A.1.3.3. 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.).



In 2019, four doctoral students obtained financial support (111.900 RON) from the budget of the Doctoral School of Mathematics of OUC, in order to participate with articles at international scientific events:

- ICoNSoM 2019 International Conference on Nonlinear Solid Mechanics – Roma, Italia, June 16-19, 2019, <http://www.memocsevents.eu/wordpress/iconsom2019/>;
- 8th International Eurasian Conference on Mathematical Sciences And Applications Baku/Azerbaijan, August 27-30, 2019, <http://www.iecmsa.org/organize/2019>.

Recommendations:

Increase the amount of money (grants obtained by the university through institutional contracts and of tuition fees collected from the doctoral students enrolled in the paid tuition system) allocated to students (attending conferences, summer schools, training, programs abroad etc.).

The indicator is partially fulfilled.

Criterion A.2. Research infrastructure

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

The analysis of the standard is based on the self-assessment file submitted to ARACIS.

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

The research activities specific to the doctoral program in the field of Mathematics are carried out in educational spaces equipped with equipment corresponding to the imposed research requirements. For the doctoral students of the Doctoral School of Mathematics there is no need for special research labs. They can use (when needed) the computer labs of the Faculty of Mathematics and Informatics, as well as the library of the OUC.

Recommendations: /

The indicator is fulfilled.

Criterion A.3. Quality of Human Resources

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

The analysis of the standard is based on the self-assessment file submitted to ARACIS.



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

The indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

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

The indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

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

The indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

Performance Indicator *A.3.1.4. The percentage of doctoral thesis advisors who concomitantly coordinate more than 8 doctoral students, but no more than 12, who are themselves studying in doctoral programs³ does not exceed 20%.

The indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

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

The analysis of the standard was based on the CVs from the self-assessment file submitted to ARACIS.

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

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.

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.

In Annex A.3.2.1, 20 archived theses of 4 members out of the 5 doctoral supervisors from the Doctoral School of Mathematics are to be found.

Recommendations: /

The indicator is fulfilled.

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

All the doctoral supervisors from the Doctoral School of Mathematics form the field of Mathematics and continuously active at the scientific level, exceeding the score requested by the minimal standards CNATDCU that were valid at the time of the evaluation and also obligatory in order to obtain the habilitation certificate based on the scientific results from the last 5 years.

Recommendations: /

The indicator is fulfilled.

Domain B. EDUCATIONAL EFFECTIVENESS

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

The analysis of the standard is based on the self-assessment file submitted to ARACIS as well as on the discussions held online during the visit.

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.



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 indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

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

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.

Admission to the doctoral programme of the Doctoral School of Mathematics is based on selection criteria that include: academic, research and professional experience of the applicants, scientific publications, a research topic proposal, materialized within an interview with the applicant.

Recommendations: /

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 indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

Criterion B.2. The content of doctoral programs

The analysis of the standard was based on the self-assessment file submitted to ARACIS, as well as on the discussions held online during the visit.

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

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 requirements are sustained by the Course descriptions from the academic year 2020-2021 and the curriculum of the Doctoral School of Mathematics 2020-2021. The training programme based on advanced academic studies on each module contains 5 subjects relevant to the preparation for scientific research of the doctoral students, of which at least one subject is called "The Methodology of scientific research".

Recommendations: /

The indicator is fulfilled.

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

Performance Indicator B.2.1.2. 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 training programme based on advanced academic studies on each module contains the subject "Ethics and Academic Integrity".

Recommendations: /

The indicator is fulfilled.

Performance Indicator B.2.1.3. The IOSUD has mechanisms to ensure that the academic training program based on advanced university studies addresses „the learning outcomes“, specifying the knowledge, skills, responsibility and autonomy that doctoral students should acquire after completing each discipline or through the research activities⁵.

Within the OUC, the Operational procedure concerning the creation, update and approval of the course descriptions for the Bachelor's and Master's study programs, full-time education exists and is applied.

Recommendations: /

The indicator is fulfilled.

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

The indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.



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

The indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is 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.

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

The analysis of the standard is based on the self-assessment file submitted to ARACIS, as well as on the discussions held online during the visit.

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

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.

The indicator is fulfilled according to the data given by OUC department.

Recommendations: /

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 indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

Standard B.3.2. The Doctoral School engages a significant number of external scientific specialists in the



commissions for public defense of doctoral theses in the analyzed domain.

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 indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

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

The indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

Domain C. QUALITY MANAGEMENT

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

The analysis of the field is based on the self-assessment file submitted to ARACIS, as well as on the discussions held online during the visit.

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.

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

- (a) the scientific work of Doctoral advisors;
- (b) the infrastructure and logistics necessary to carry out the research activity;
- (c) the procedures and subsequent rules based on which doctoral studies are organized;
- (d) the scientific activity of doctoral students;
- (e) the training program based on advanced academic studies of doctoral students;
- (f) social and academic services (including for participation at different events, publishing papers etc.)

and counselling made available to doctoral students.



Self and peer-assessments and assessments of the Doctoral School of Mathematics' Director can be found in SDMate_Anexa_C_111_a. A recent analysis, included in the assessed period 2016-2020, is the Self-assessment Report on the activity of the OIDUS from "Ovidius" University of Constanta.

Recommendations: /

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 indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

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

The analysis of the field is based on the self-assessment file submitted to ARACIS, as well as on the discussions held online during the visit.

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:

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

The Doctoral School, through IOSUD, uploads information on the organizing institution's website, complying with the general regulations involving data protection <http://www.univ-ovidius.ro/educatie/doctorat>.



Recommendations: /

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.

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 indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

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

Each doctoral student has access to an electronic system that verifies the degree of similarity with other existing scientific or artistic creations, when required with the consent of the supervisor.

Recommendations: /

The indicator is fulfilled.

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

For the doctoral students of the Doctoral School of Mathematics there is no need for special research labs. They can use (when needed) the computer labs of the Faculty of Mathematics and Informatics.

Recommendations: /

The indicator is fulfilled.

Criterion C.3. Internationalization

The analysis of the field is based on the self-assessment file submitted to ARACIS, as well as on the discussions held online during the visit.

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

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



the European Higher Education Area.

The assessed field of study has made a mobility agreement with the Trento University in Italy, through the Organizing Institution of University Doctoral Studies (IOSUD). In the Mathematics field (and the related field of Informatics) there are ERASMUS agreements with the universities in Ankara and Piri Reis, Turkey, Erlangen-Nurnberg, Germany and the Belfort -Montbeliard University of Technology, France etc. The demands are sustained also because of the fact that 6 doctoral students out of the total of 16 (37,5%) have at least one participation or more with papers presented at international conferences.

The graduate and doctoral students from the assessed period (1.10.2013- 30.09.2018) have participated to the 3 International Workshops of Mathematical Modeling in Environmental Issues and Life Sciences, which have had as participants various, outstanding personalities from the applied mathematics field and was organized by the Faculty of Mathematics and Informatics from the Ovidius University of Constanta, in 2014, 2016 and 2018.

Recommendations: /

The indicator is fulfilled.

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

The indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

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

The indicator is fulfilled according to the data given by OUC department.

Recommendations: /

The indicator is fulfilled.

SWOT Analysis

<u>Strengths:</u>	<u>Weaknesses:</u>
<ul style="list-style-type: none">– The existence of a young team with remarkable professional achievements and with active collaborations at international level.– There is an active concern in including doctoral students in research projects.	<ul style="list-style-type: none">– Low number of doctoral students.– Reduced financial support for doctoral students provided by the "Ovidius" University of Constanta.

<u>Opportunities:</u>	<u>Threats:</u>
<ul style="list-style-type: none"> – Opening of the socio-economic environment for collaborations with the academic environment can entail opportunities to participate in research projects and increase the chances of success of project proposals. – Hiring PhD students as research assistants for a fixed period of time brings PhD students closer to the university environment and opens opportunities of their employment after completing their studies. 	<ul style="list-style-type: none"> – Low number of national research project calls as well the low success rate make it difficult to win enough projects to provide another source of funding for PhD students. – Low salary at the level of assistant professor (compared to the economic environment in the IT field) makes the doctoral studies less attractive. – Reduced demand from graduates to pursue a doctorate in Mathematics.

Overview of judgments awarded and of the recommendations

No.	Type of indicator (*, C)	Performance indicator	Judgment	Recommendations
1.	IP	A.1.1.1	Fulfilled	
2.	IP	A.1.1.2	Fulfilled	
3.	IP	A.1.2.1.	Fulfilled	
4.	IP	A.1.2.2	Fulfilled	
5.	IP	A.1.3.1	Fulfilled	
6.	IP	A.1.3.2	Fulfilled	
7.	IP*	A.1.3.3	Partially Fulfilled	Increase the amount of money allocated to students.
8.	IP	A.2.1.1	Fulfilled	
9.	IP	A.3.1.1	Fulfilled	
10.	IP*	A.3.1.2	Fulfilled	
11.	IP	A.3.1.3	Fulfilled	
12.	IP*	A.3.1.4	Fulfilled	
13.	IP	A.3.2.1	Fulfilled	
14.	IP*	A.3.2.2	Fulfilled	
15.	IP*	B.1.1.1	Fulfilled	
16.	IP*	B.1.2.1	Fulfilled	
17.	IP	B.1.2.2	Fulfilled	
18.	IP	B.2.1.1	Fulfilled	
19.	IP	B.2.1.2	Fulfilled	
20.	IP	B.2.1.3	Fulfilled	
21.	IP	B.2.1.4	Fulfilled	
22.	IPC	B.2.1.5	Fulfilled	
23.	IPC	B.3.1.1	Fulfilled	
24.	IP*	B.3.1.2	Fulfilled	
25.	IP*	B.3.2.1	Fulfilled	
26.	IP*	B.3.2.2	Fulfilled	

27.	IP	C.1.1.1	Fulfilled	
28.	IP*	C.1.1.2	Fulfilled	
29.	IPC	C.2.1.1	Fulfilled	
30.	IP	C.2.2.1	Fulfilled	
31.	IP	C.2.2.2	Fulfilled	
32.	IP	C.2.2.3	Fulfilled	
33.	IP*	C.3.1.1	Fulfilled	
34.	IP	C.3.1.2	Fulfilled	
35.	IP	C.3.1.3	Fulfilled	

Conclusions and general recommendations

Based on the findings of the evaluation team presented in this report it is estimated that OUC is a higher education institution capable of providing high confidence in the quality of education and scientific research for all cycles of university studies and, in particular, for doctoral studies. This also applies to the department of Mathematics and is supported by the following arguments:

- Experienced and internationally recognized professors.
- The quality of scientific publications of doctoral supervisors and doctoral students.
- Support provided to doctoral students in research.

Following the external evaluation process at the field of Mathematics, the evaluation team formulates the following recommendations:

- Ensuring the international standards of material basis necessary for doctoral scientific research.
- Attracting more resources and their diversification to financially support PhD supervisors and PhD students in their efforts to publish the results of scientific research in prestigious journals.
- Intensification of measures to increase the degree of internationalization (international guidance/support commissions, research internships abroad, international students, co-supervised theses, etc.).
- Increasing the number of collaborations with foreign universities (partnerships in research projects, academic consortia, consortia of doctoral schools, etc.).
- Increasing the number of mobilities (ingoing, outgoing).
- Attracting more young people for career in Mathematics.

Koper, 26 November 2021

Prof. dr. Ajda Fošner