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Only the German language version of the doctoral degree regulations published in the Official Bulletins (Amtliche Mitteilungen 43/2025) of the University of Cologne is legally binding. The English version is solely intended as information for our English-speaking Doctoral Candidates.

**Doctoral Degree Regulations
of the Faculty of Mathematics and Natural Sciences of the
University of Cologne
of 11 June 2025**

Based on § 2 (4) and § 67 (3) of the Higher Education Act of the State of North Rhine-Westphalia (Higher Education Act, HG) in the version of the Higher Education Future Act (HZG NRW) of September 16, 2014 (GV. NRW. p. 547), last amended by article 2 of the act to strengthen Bochum as a University location in the field of healthcare and to amend other higher education regulations of December 19, 2024 (GV. NRW. p. 1222), the Faculty of Mathematics and Natural Sciences of the University of Cologne issues the following Doctoral Degree regulations.

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Appendix 1

§ 1

Doctoral Degree

(1) ¹The Faculty of Mathematics and Natural Sciences (hereinafter referred to as the Faculty) awards the degree of Doktor der Naturwissenschaften (doctor rerum naturalium, abbreviation: Dr. rer. nat.; english: Doctor of Philosophy in Natural Sciences, abbreviation Ph.D. after successful participation in a structured doctoral study program accompanying the doctoral project (§ 6) and on the basis of a scientific paper (Dissertation § 8) written or electronically written and published by the Doctoral Candidate in one of the doctoral subjects (Appendix 1) and an oral examination (disputation § 10).

(2) ¹The Faculty may confer the degree and dignity of an honorary Doktor der Naturwissenschaften (doctor rerum naturalium honoris causa, abbreviated to Dr. rer. nat. h. c.) for outstanding scientific achievements. ²The awarding of this title requires that at least five members of the group of professors of the Faculty propose this. ³The professors of the Faculty Council with voting rights shall decide on the proposal by secret ballot. ⁴Acceptance of the proposal requires the approval of two thirds of the members of this group present. ⁵The honorary doctorate is awarded by presenting a certificate recognizing the merits.

§ 2

Doctoral Degree Committee

(1) ¹The Doctoral Degree Committee shall be responsible for decisions on doctoral matters, unless otherwise stipulated in these Doctoral Degree Regulations.

(2) ¹The Doctoral Degree Committee consists of the following members with voting rights:

a) the Dean as Chair of the Doctoral Degree Committee; in addition, the Faculty Council elects a deputy who is a member of the group of professors of the faculty; their term of office is four years; re-election is possible;

b) the Vice Dean for Gender Equality, Diversity and Early Career Researchers; the Vice Dean for Research is the deputy;

c) one member each from the group of professors of the Departments of Biology, Chemistry and Biochemistry, Mathematics and Natural Sciences Education, Geosciences, Mathematics/Computer Science and Physics; they may not already be members in accordance with letters a) or b); they are elected by the Faculty Council on the recommendation of the respective Department Committee; in addition, the Faculty Council elects their deputies on the recommendation of the respective Department committee; their respective term of office is four years; re-election is possible;

d) two members from the group of academic staff members; they should hold a doctorate; they are elected by the Faculty Council on the recommendation of the members of the group of academic staff members of the Faculty Council; their respective term of office is four years; re-election is possible;

e) two members from the group of academic staff who are Doctoral Candidates in accordance with § 5; they are elected by the Faculty Council on the recommendation of the members of the group of academic staff of the Faculty Council; their respective term of office is two years; re-election is possible;

f) two members from the group of students who are Doctoral Candidates in accordance with § 5; they are elected by the Faculty Council on the recommendation of the members of the group of students of the Faculty Council; their respective term of office is two years; re-election is possible;

g) one member from the group of employees in technology and administration, who is elected by the Faculty Council on the recommendation of the member of this group in the Faculty Council; the term of office is four years; re-election is possible.

(3) ¹The members referred to in subsection 2 letters d) to g) shall each have a deputy elected by the Faculty Council. ²The deputy members pursuant to letters d) and e) shall be elected on the proposal of the group of academic staff of the Faculty Council. ³The deputy members according to letter f) are elected on the recommendation of the group of students of the Faculty Council. ⁴The deputy member according to letter g) is elected on the recommendation of the group of technical and administrative staff of the Faculty Council. ⁵The term of office of the deputy members according to sentence 1 ends with the term of office of the corresponding member. ⁶Re-election is possible.

(4) ¹If a member or deputy member resigns in accordance with subsection 2 letters a) and c) to g) or subsection 3, the Faculty Council shall elect a new member or a new deputy member to take office until the end of the term of office of the resigning member or deputy member.

(5) ¹The member of the group of technical and administrative staff who is a member of the Doctoral Degree Committee or the deputy member of this group shall only have voting rights in doctoral matters if he or she performs corresponding functions at the University and has particular experience in the respective area. ²The Chairperson shall decide whether these requirements are met at the beginning of the term of office of the member or deputy member; in cases of doubt, the Rectorate shall decide.

(6) ¹The members of the spokesperson team of the Board of the Faculty's Graduate Schools in accordance with § 3 subsection 3 or their deputies shall attend the meetings of the Doctoral Degree Committee in an advisory capacity. ²Further advisors may be invited to the meeting of the Doctoral Degree Committee.

(7) ¹The Doctoral Degree Committee shall constitute a quorum if at least half of the members entitled to vote are present. ²In matters that directly concern teaching, with the

exception of its evaluation, the members from the group of University lecturers shall have at least half of the votes. ³In matters directly relating to research, the members from the group of University lecturers shall have the majority of votes. ⁴The Doctoral Degree Committee shall decide by a simple majority of the voting members present at the meeting. ⁵In the event of a tie, the chairperson or their deputy shall have the casting vote.

(8) ¹The meetings of the Doctoral Degree Committee are not public and take place at least once per semester, generally in person. ²The chairperson may decide that the meeting shall take place in electronic communication. ³The decision shall become ineffective if half of the members of the Doctoral Degree Committee object to it before the meeting. ⁴In the case of meetings in electronic communication, the chairperson may also decide that resolutions are to be passed in electronic communication; this may be deviated from by a resolution of the committee. ⁵Resolutions may also be passed by way of circulation, provided no member objects. ⁶The members and their deputies are subject to official secrecy. ⁷If they are not in public service, they must be sworn to secrecy by the chairperson.

(9) ¹The Doctoral Degree Committee shall ensure that the provisions of these regulations are observed. ²In particular, it decides on appeals against decisions made in doctoral matters. ³The Chairperson of the Doctoral Degree Committee or, if he or she is unable to attend, his or her deputy shall represent the Doctoral Degree Committee. ⁴He or she shall convene the meetings of the Doctoral Degree Committee, chair them and implement the resolutions passed there. ⁵The Doctoral Degree Committee may delegate the completion of its tasks for all regular cases to the Chairperson of the Doctoral Degree Committee in accordance with subsection 2 letter a). ⁶Decisions on appeals against decisions of the Chairperson shall be reserved for the Doctoral Degree Committee. ⁷The Chairperson shall announce instructions, deadlines and time limits as well as other notifications of the Doctoral Degree Committee, which do not only concern individual persons, in a suitable form on the Faculty's internet portal with legally binding effect.

(10) ¹The Doctoral Degree Committee has access to the Doctoral Office of the Dean's Office of the Faculty for the organizational handling of the admission and examination procedures.

§ 3

Graduate Schools of the Departments

(1) ¹The Faculty has established a Graduate School for each Department at the suggestion of the Department and has adopted separate regulations for each of these.

(2) ¹The Graduate Schools of the Departments promote the academic exchange of doctoral students within the Department and beyond. ²They offer a structured, quality-assuring doctoral study program and regulate the advising and supervision of Doctoral Candidates. ³They coordinate - also across Departments - the offer of courses for the acquisition of key academic qualifications and for the further academic training of Doctoral Candidates, whereby parts of this offer may be mandatory for the Doctoral Candidates' membership of the Graduate School.

(3) ¹The faculty shall form a Executive Board of all Graduate Schools of the Departments. ²The members of this board are the spokespersons and coordinators of the Graduate Schools of the Departments and the Vice Dean for Gender Equality, Diversity and Early Career Researchers and, as deputy, the Vice Dean for Research. ³This board elects a team of spokespersons consisting of a spokesperson from one of the Graduate Schools and a coordinator from one of the Graduate Schools as well as their deputies. ⁴The term of office

of the team of spokespersons and deputies is two years. ⁵Re-election is possible. ⁶The team of spokespersons represents the common interests of the Graduate Schools vis-à-vis the institutions, committees and bodies of the Faculty and the University. ⁷In addition, the Executive Board ensures comparable quality standards in the Graduate Schools of the Faculty and participates in the further development of the Graduate Schools.

(4) ¹As a rule, Doctoral Candidates become doctoral members of the Graduate School of the Department to which the doctoral subject is assigned (Appendix 1). ²Objections to membership and withdrawal from a Graduate School remain unaffected.

§ 4

Access to doctoral studies and doctoral subjects

(1) ¹A doctorate can only be completed in a doctoral subject of the Faculty of Mathematics and Natural Sciences of the University of Cologne. ²The doctoral project must correspond to the type of doctoral subject represented at the Faculty. ³Each doctoral subject is assigned to a Department, in the case of an interdisciplinary doctoral subject also to other Departments. ⁴The doctoral subjects and their assignment are regulated in Appendix 1. ⁵The doctoral study program and the doctorate require knowledge of German or English at a level of at least B2 of the Common European Framework of Reference for Languages.

(2) ¹The prerequisite for admission to the doctoral program in accordance with § 67 HG is

a) a degree from a consecutive Master's program relevant to the doctoral subject within the meaning of § 61 (2) sentence 2 HG, or

b) a degree from a relevant University degree program with a general standard period of study of at least eight semesters, for which a degree other than a Bachelor's degree is awarded, or

c) a degree after a relevant University degree program with a general standard period of study of at least six semesters, which was completed with an ECTS grade of A or with a grade which identifies the graduate as belonging to the top 10% of the class or, if neither the ECTS grade nor the relative position in the cohort can be determined, was completed with a grade of 1.5 or better; in addition, proof of appropriate studies in the doctoral subject following the University studies is required; as a rule, these correspond to a subject-specific academic specialization of two semesters; the Doctoral Degree Committee may determine that these preparatory studies for the doctorate, insofar as they are offered by a Master's degree program or a Graduate School of the Faculty, are to be completed at the University of Cologne (so-called fast-track option); admission to the doctoral program is initially conditional for the period during which the preparatory studies for the doctorate are completed; the final decision is made by the Doctoral Degree Committee.

(3) ¹Admission to the doctoral program is dependent on proof of a relevant and qualified degree in accordance with subsection 2. ²As a rule, a qualified degree exists if an academic thesis has been completed in the underlying degree program. ³If the underlying course of study does not include an academic thesis, evidence must be provided of an academic thesis completed subsequent to the underlying course of study which demonstrates the candidate's suitability for a doctorate.

(4) ¹In exceptional cases, the Doctoral Degree Committee shall decide on admission to the doctoral program if a degree is only relevant to a limited extent or if the degree is not

qualifying. ²In such exceptional cases, the Doctoral Degree Committee shall generally determine that further in-depth study and/or examination achievements need to be completed. ³As a rule, a deadline of two complete semesters after enrolment is set for the completion of the coursework and/or examinations. ⁴In this case, admission to the doctoral program is initially granted provisionally subject to the completion of the coursework and/or examinations. ⁵The final decision is made by the Doctoral Degree Committee.

§ 5

Admission as a Doctoral Candidate and enrolment

(1) ¹At the beginning of the doctoral project, the applicant applies for admission to the doctoral program electronically via the application portal of the University of Cologne.

(2) ¹The assessment of the application for admission is carried out by the Doctoral Degree Committee, which decides on the fulfillment of the formal and subject-specific admission requirements for admission in accordance with § 4. ²Irrespective of this, the International Office of the University of Cologne is responsible for assessing all foreign secondary school and University certificates.

(3) ¹The application for admission must be submitted in German or English. ²The application must be accompanied by

a) the application form of the Doctoral Degree Committee, which contains the following information

- the provisional doctoral topic (working title)
- the doctoral subject
- the date of the planned or already completed start of the doctoral project
- as a rule, the agreement of an advisor in accordance with § 15 to supervise the doctoral project, whereby the advisor can make the agreement to supervise dependent on the Doctoral Candidate's membership of the Department's Graduate School
- confirmation of registration in the Department's Graduate School or confirmation of objection to this membership;

b) proof of all University degrees (certificates, diplomas and transcripts);

c) in the event of an objection to membership of the Department's Graduate School, as a rule a supervision agreement with a commitment to take on the co-supervision of the doctoral project by a second advisor in accordance with § 15 subsection 2, who generally belongs to the group of University lecturers of the Faculty of Mathematics and Natural Sciences and works full-time at the University of Cologne.

(4) ¹In the case of doctoral projects that are not carried out at an academic institution of the Faculty of Mathematics and Natural Sciences or the academic institution of the advisor in accordance with § 15, admission as a Doctoral Candidate must be applied for before or at the beginning, but generally within 6 months of the start of work on the doctoral project at the latest. ²Further evidence may be requested with the application, such as a description of the doctoral project, a statement regarding the subject classification of the doctoral project in accordance with (4) sentence 1 by the Institute or Department representing the doctoral subject and/or a statement from the institution at which the doctoral project is being carried out. ³If a doctoral project is carried out under the supervision of a University lecturer from

another faculty of the University of Cologne or another German University and this University lecturer is granted the right of supervision for this individual case in accordance with § 15 (3 or 4), this generally requires, in addition to further evidence in accordance with sentence 2, the commitment of a full-time member of the group of professors of the Faculty of Mathematics and Natural Sciences at the University of Cologne to participate in the supervision of the doctoral project and as an reviewer and examiner in the doctoral examination procedure. ⁴This professor of the Faculty of Mathematics and Natural Sciences must be authorized to supervise in the doctoral subject of the doctoral project or a closely related subject. ⁵If the doctoral project is not carried out at the University of Cologne and involves the collection and analysis of primary data or the generation of sample material, an agreement is required in which the accessibility of the primary data and the archiving of this data as well as the availability of the experimental protocols for the assessment of the Dissertation and for any examination that may take place are regulated in accordance with the rules of good scientific practice by the responsible office at the University of Cologne. ⁶Furthermore, the publication of the Dissertation shall be regulated in accordance with these Doctoral Degree regulations. ⁷In the case of doctoral projects in cooperation with a University of Applied Sciences pursuant to § 19 or a German University, a supervision or cooperation agreement is required. ⁸For doctoral projects in cooperation with the industry or other institutions, a supervision, cooperation or non-disclosure agreement is required. ⁹In the case of doctoral projects in cooperation with a foreign University, a Cotutelle agreement in accordance with § 18 is required.

(5) ¹The Doctoral Degree Committee shall decide whether the requirements pursuant to § 4 subsections 1 to 3 have been met and, if applicable, on an offer of admission subject to reservation pursuant to § 4 subsection 2, letter c and § 4 subsection 4. ²In addition to the information and evidence provided pursuant to subsection 3 and, if applicable, subsection 4, further evidence and a description of the doctoral project may be requested from the applicant in order to reach a decision. ³In order to decide whether the requirements for admission eligibility pursuant to § 4 subsection 2 and subsection 3 have been met, an expert opinion may be obtained from the Master's Degree Committee with a close affinity to the doctoral subject, the Graduate School of the Department representing the doctoral subject, or a person appointed by the Department for this purpose. ⁴Further expert opinions with a specialist statement may be obtained.

(6) ¹If the formal and subject-specific admission requirements are met, the applicant will be informed by email of an offer of admission or an offer of admission with conditions. ²In the case of a conditional offer of admission, this is issued subject to the condition that the studies or additional study and/or examination achievements preparing for the doctorate are completed and proven within the deadline.

(7) ¹In the event of a negative decision, the applicant will receive a written or electronic notification of rejection, which will be accompanied by information on legal remedies.

(8) ¹After receiving the offer of admission, the applicant must enroll at the University of Cologne. ²Upon enrolment, he or she becomes a Doctoral Candidate. ³The date of enrolment as a Doctoral Candidate at the University of Cologne is the date of the start of the doctorate according to the Higher Education Statistics Act (HG). ⁴Enrolment is compulsory until the end of the doctoral examination procedure. ⁵Failure to re-enroll for enrolment in the next semester means that the doctoral studies are deemed to have been discontinued. ⁶Re-enrollment is possible upon application.

(9) ¹The Doctoral Candidate is obliged to inform the doctoral office of the Dean's Office immediately if there are any changes to the information provided in accordance with

subsection 3 letters a) and c). ²When leaving the Department's Graduate School, a supervision agreement and the confirmation of a second advisor in accordance with subsection 2 letter c) must generally be submitted subsequently. ³If the Doctoral Candidate's advisor has made the supervision dependent on membership of the Department's Graduate School or if the advisor's right to supervise Doctoral Candidates is restricted to members of a Department's Graduate School, the Doctoral Candidate must generally find another advisor.

(10) ¹The applicant and the Doctoral Candidate are obliged to cooperate in the administrative processes and procedures used at the University of Cologne; § 6 of the Enrolment Regulations of the University of Cologne, as amended, shall apply accordingly. ²After enrolment as a Doctoral Candidate, an electronic file will be created in the University of Cologne's registration and administration software for Doctoral Candidates.

§ 6

Doctoral study program

(1) ¹Doctoral Candidates participate in a structured doctoral study program that supports the quality of the doctoral project. ²A Thesis Advisory Committee shall be set up for each Doctoral Candidate, consisting of the advisor and at least one other person who will accompany the doctoral project in an advisory capacity as a mentor. ³Participation in the doctoral study program is generally subject-specific as a member of the Graduate School of the Department to which the doctoral subject is assigned. ⁴Doctoral Candidates who object to membership of the Department's Graduate School or who leave the Graduate School (i.e. non-Graduate School members) must generally conclude a supervision agreement with a second advisor in accordance with § 5 subsection 3 c), who will accompany the doctoral project in an advisory capacity as a mentor.

(2) ¹Members of Graduate Schools participate in the subject-specific doctoral study program of the Graduate School. ²The doctoral study program for non-Graduate School members includes the following mandatory elements:

- a) participation in an advanced training course on good scientific practice (which should take place within the first year of starting work on the doctoral project);
- b) a written or electronic proposal for the doctoral project (project proposal), which is presented to and discussed with the advisor and the second advisor; proof must be provided no later than 12 months after the start of work on the doctoral project;
- c) from the second year after the start of work on the doctoral project, an annual progress report on the scientific work on the doctoral project (Project Report), which is presented to and discussed with the advisor and the second advisor; proof of the first progress report must be provided no later than 24 months after the start of work on the doctoral project; proof of further progress reports must be provided annually, but no later than 18 months after proof of the previous report.

(3) ¹The presentation of the project proposal and the project reports usually takes place during a joint face-to-face or digital meeting (usually a TAC meeting) with the Thesis Advisory Committee. ²In this meeting, the objectives of the research project, the understanding of the scientific question and the existence of a basis for the independent scientific work should be discussed. ³Minutes of the meeting must be taken and submitted to the Department's Graduate School (Graduate School members) or the doctoral office (non-Graduate School members). ⁴The meeting also includes a confidential discussion on the supervision and work situation without the advisor being present.

(4) ¹If a meeting gives rise to indications of a conflict between the Doctoral Candidate and the advisor and if the Doctoral Candidate is a member of the Graduate School, the mentors should inform the Graduate School of the Department about this; in the case of non-Graduate School members, the mentor should inform the ombudsperson of the faculty.

(5) ¹If the TAC meeting on the project proposal or the project report raises considerable doubts about the objective of the research project, the understanding of the scientific question and/or the availability of knowledge and basic skills for independent scientific work, the advisor must inform the Department's Graduate School (Graduate School members) or the doctoral office (non-Graduate School members). ²In this case, a further TAC meeting should take place within 6 months. ³As a rule, in addition to the advisor and the mentors or the second advisor, another professor of the faculty, who is appointed by the Board of the Department's Graduate School in consultation with the Doctoral Degree Committee, shall attend the repeat meeting. ⁴If doubts about the academic quality of the doctoral project or the qualification for independent academic work are not dispelled, a consultation regarding the academic and professional prospects should take place in consultation with the faculty ombudsperson.

§ 7

Admission to the doctoral examination procedure

(1) ¹The Doctoral Candidate applies for admission to the doctoral examination procedure. ²The application can be submitted at the earliest 24 months after enrolment in the doctoral program as a Doctoral Candidate in accordance with § 5. ³The Doctoral Degree Committee shall decide on justified exceptions, for example if the Doctoral Candidate has moved from another faculty or another University during the doctoral project, which is associated with a new appointment of the advisor to the faculty, or in the case of outstanding scientific results achieved within a shorter period of time.

(2) ¹The application must be accompanied by

a) the application form containing the following information

- the full name and place of birth
- the doctoral subject;
- the topic of the doctorate;
- the type of Dissertation (monograph or cumulative);
- the name of the advisor;
- a proposal by the Doctoral Candidate for the reviewers of the Dissertation in accordance with § 9 subsections 1 and 2
- a proposal of the Doctoral Candidate or of the Doctoral Candidate on the composition of the examination committee in accordance with § 10 subsection 2;
- the acknowledgement of the coordinator of the Graduate School of the responsible Department and with Graduate School membership, the confirmation of participation in the doctoral study program of the Graduate School;
- a declaration by the Doctoral Candidate stating whether he or she has already attempted - successfully or unsuccessfully - to obtain a Doctoral Degree or

whether he or she is in the process of obtaining a Doctoral Degree and whether a Doctoral Degree has been withdrawn;

b) a curriculum vitae with photograph in German or English;

c) proof of successful participation in the doctoral study program (§ 6 subsection 2, non-Graduate School members).

²After formal assessment of the application for admission to the examination procedure (as amended) and admission to the examination procedure (in accordance with subsection 4), the Dissertation (§ 8) must be submitted to the doctoral office in electronic form (PDF/A file) and sent by the Doctoral Candidate to the reviewers and the chair of the examination committee. ³At the request of a reviewer, an examiner or the Chair of the examination committee, the Doctoral Candidate shall make the Dissertation available to them in printed form. ⁴A proposal from the Doctoral Candidate regarding the date of the Disputation must be submitted at least five working days before the start of the examination phase. ⁵The examination phases are determined and announced by the Doctoral Office. ⁶The examination phases usually begin one working day after the end of the objection period for acceptance of the Dissertation.

(3) ¹The Doctoral Degree Committee examines the application for admission to the doctorate and decides on the reviewers of the Dissertation in accordance with § 9 and on the composition of the examination committee in accordance with § 10. ²The Doctoral Candidate shall receive written or electronic notification of admission to the doctoral examination procedure, stating the reviewers and the composition of the examination committee. ³The advisor shall be informed of the admission of the Doctoral Candidate to the doctoral examination procedure. ⁴In the event of a negative decision, the candidate will receive a written or electronic notification of rejection, which will include information on legal remedies.

(4) ¹The application for admission to the doctoral examination procedure may be withdrawn once by the Doctoral Candidate without giving reasons as long as the deadline for submitting the expert reports has not yet expired.

(5) ¹A Dissertation that has not been supervised by an advisor in accordance with § 15 can only be accepted if the subject-specific nature of the Dissertation permits this in accordance with § 4 subsection 1, if performance in accordance with the doctoral study program in accordance with § 6 subsection 2, if the primary data on which the Dissertation is based, the experimental protocols and the sample and experimental material for the assessment of the Dissertation and for any examination in accordance with the rules of good scientific practice are accessible by the responsible office of the University of Cologne or are secured in public databases and a member of the group of University lecturers of the Faculty of Mathematics and Natural Sciences who has the right in accordance with § 15 subsection 2 in the corresponding doctoral subject can be appointed as an reviewer and examiner.

§ 8 Dissertation

(1) ¹The Dissertation is a written or electronic scientific work, which must demonstrate the ability to carry out independent academic work, including its presentation, and must contain scientifically significant results.

(2) ¹The Dissertation must be written in German or English and in any case contain a title page, an abstract, a comprehensive introduction, the presentation of the results, a concluding comprehensive discussion (with the exception of Dissertations in the fields of

mathematics and computer science), details of the resources used and a list of literature as well as the declaration in accordance with § 8 subsection 8. ²Additional chapters and an appendix are possible.

(3) ¹Articles published in professionally recognized, peer-reviewed media, such as journals and textbooks, and manuscripts accepted for publication (defined as publication in the following) as well as unpublished manuscripts may be included as chapters in the Dissertation, provided that the candidate's own contribution to the publications and manuscripts is substantial. ²Each of the included publications and manuscripts must be preceded by a comprehensive, comprehensible explanation in which their significance in the context of the Dissertation is explained. ³In the case of articles and manuscripts with several authors, this explanation must make it clear which specific contributions, both in terms of the results and the writing of the article, were made by the Doctoral Candidate him/herself and which were made by the co-authors.

(4) ¹A Dissertation is referred to as a monograph if fewer than three publications are included in the presentation of the results.

(5) ¹A Dissertation is designated as cumulative if the presentation of the results contains at least three publications.

(6) ¹The form and content of the Dissertation should be agreed by the Doctoral Candidate with the TAC (Graduate School members) or with the advisor and the second advisor (non-Graduate School members) in good time before submission.

(7) ¹The provisions of good scientific practice shall apply to the Dissertation. ²The Dissertation may not have been submitted by the Doctoral Candidate in the same or similar form or in part as part of another doctorate or another examination. ³However, the inclusion of results obtained as part of the candidate's own Master's, Diploma, Bachelor's or written or electronically prepared term paper for the state examination is permissible if these are identified as such.

(8) ¹The Dissertation must be accompanied by a declaration with the following wording:

„Hiermit versichere ich an Eides statt, dass ich die vorliegende Dissertation selbstständig und ohne die Benutzung anderer als der angegebenen Hilfsmittel und Literatur angefertigt habe. Alle Stellen, die wörtlich oder sinngemäß aus veröffentlichten und nicht veröffentlichten Werken dem Wortlaut oder dem Sinn nach entnommen wurden, sind als solche kenntlich gemacht. Ich versichere an Eides statt, dass diese Dissertation noch keiner anderen Fakultät oder Universität zur Prüfung vorgelegen hat; dass sie – abgesehen von unten angegebenen Teilpublikationen und eingebundenen Artikeln und Manuskripten – noch nicht veröffentlicht worden ist sowie, dass ich eine Veröffentlichung der Dissertation vor Abschluss des Prüfungsverfahrens der Promotion nicht vornehmen werde. Die Bestimmungen der Promotionsordnung der Mathematisch-Naturwissenschaftlichen Fakultät der Universität zu Köln sind mir bekannt. Darüber hinaus erkläre ich hiermit, dass ich die Ordnung zur Sicherung guter wissenschaftlicher Praxis und zum Umgang mit wissenschaftlichem Fehlverhalten der Universität zu Köln gelesen und sie bei der Durchführung der der Dissertation zugrundeliegenden Arbeiten und der schriftlich oder elektronisch verfassten Dissertation beachtet habe, und verpflichte mich hiermit, die dort genannten Vorgaben bei allen wissenschaftlichen Tätigkeiten zu beachten und umzusetzen.“

(English translation: "I hereby declare that I have prepared the present dissertation independently and without using any aids or literature other than those indicated. All passages that have been taken verbatim or in substance from published or unpublished works, in wording or in meaning, are identified as such. I declare under oath that this dissertation has not previously been submitted to any other faculty

or university for examination; that it — apart from the publications and embedded articles and manuscripts listed below — has not yet been published, and that I will not publish the dissertation before the conclusion of the doctoral examination procedure. I am aware of the terms of the doctoral degree regulations of the Faculty of Mathematics and Natural Sciences of the University of Cologne. Furthermore, I hereby declare that I have read the regulations on ensuring good scientific practice and on dealing with scientific misconduct of the University of Cologne, and that I have complied with them in carrying out the work underlying this dissertation and in preparing this dissertation in written or electronic form, and I hereby undertake to observe and implement the rules set out therein in all my scientific activities.”)

²In the case of Dissertations with integrated articles and manuscripts in accordance with (5), only the independently written part constitutes the Dissertation in the sense of the declaration. ³If the affirmation in lieu of oath has been submitted falsely, the legal consequences of § 63 (5) HG may apply.

(9) ¹If the Dissertation involves the collection of primary data or the analysis of such data, or if the reproducibility of the results presented in the Dissertation requires the availability of data analyses, test protocols or sample material, the Dissertation must explain how these data and materials are secured and accessible. ²If this declaration has been made incorrectly, the legal consequences of § 63 (5) HG may apply.

(10) ¹The Dissertation must be submitted in electronic form as a PDF/A file. ²If the amount of data relevant to the Dissertation and/or its data form precludes its inclusion in the PDF/A file, a list of the attachments with their storage location on data servers must be included in the Dissertation. ³For the assessment of the Dissertation, these attachments may be stored in a protected form on a scientific or non-commercial data server (e.g. Sciebo, <https://hochschulcloud.nrw/>), provided that this data has not yet been permanently stored on scientific data servers or published as part of publications.

§ 9

Assessment and evaluation of the Dissertation

(1) ¹At least two reviews shall be obtained to assess the Dissertation. ²The reviewers of the Dissertation shall be appointed by the Doctoral Degree Committee. ³When appointing the reviewers, the requirements set out in § 16 must be observed. ⁴If only one of the reviewers is a University lecturer at the Faculty of Mathematics and Natural Sciences, this person is generally employed full-time at the University of Cologne and belongs to the group of professors at the faculty or is employed full-time at the Faculty of Mathematics and Natural Sciences and is a junior professor.

(2) ¹In special cases, the Doctoral Degree Committee may call in additional reviewers, for example for reasons to be explained or if the Dissertation was carried out in cooperation with a University of applied sciences, external University or research institution. ²This additional reviewer must fulfill the requirements set out in § 16.

(3) ¹An independent external reviewer shall be appointed in addition to the reviewers pursuant to (1) and (2) if the Dissertation maybe awarded a grade of "0" = with distinction (summa cum laude) by all reviewers in accordance with a vote by the advisor or a reviewer or has been awarded a grade of "0" = with distinction (summa cum laude) by all reviewers. ²This external reviewer should be a professor at a University or hold an equivalent position at a research institution and must fulfill the requirements set out in § 16. ³The grade proposed by this additional reviewer shall be included in the calculation of the grade in accordance with § 12 subsection 2.

(4) ¹A further reviewer shall be appointed in addition to the reviewers according to (1) to (3) if the proposed grades differ by more than one grade. ²This additional reviewer must fulfill the requirements set out in § 16.

(5) ¹The reviewers shall review the Dissertation independently of each other. ²They recommend the acceptance or rejection of the Dissertation and they grade the Dissertation in accordance with § 12.

(6) ¹The review should take place within four weeks. ²In justified exceptional cases, the Doctoral Degree Committee may grant an extension of the deadline to a maximum of three months. ³If a review has not been submitted after the extended deadline, if applicable, the assignment for the review shall normally expire and the Doctoral Degree Committee shall appoint a new reviewer.

(7) ¹If there are objections to the research approach, research implementation, research results or their presentation that prevent the thesis from being accepted, a reviewer may recommend to the Doctoral Degree Committee that the acceptance of the thesis be made dependent on a prior revision. ²If the Doctoral Degree Committee follows this recommendation, the Dissertation must be revised within a period of 12 months. ³With the new version, a comparison with the original version and marking of the changes, if necessary with the comments of the reviewers, must be resubmitted. ⁴Once the revised Dissertation has been submitted, it shall be reviewed again. ⁵A second revision of the Dissertation is excluded. ⁶If the revised Dissertation is not submitted on time by the Doctoral Candidate for reasons for which he or she is responsible, the doctorate is irreversibly failed.

(8) ¹The reviews are available for inspection together with the Dissertation for five working days in the doctoral office of the Dean's Office for the professors of the Faculty. ²They may lodge a reasoned objection to the acceptance or rejection of the Dissertation and to the proposed grading up to the sixth working day after the start of the display.

(9) ¹The Dissertation is accepted if the reviewers have voted in favor of acceptance and no justified objection is raised by a person entitled to inspect the Dissertation in accordance with subsection 8. ²If an objection is raised, the Doctoral Degree Committee may obtain a further expert opinion on the Dissertation. ³Subsection 8 shall apply accordingly in this case. ⁴The Doctoral Degree Committee shall make the final decision on the acceptance or rejection of the Dissertation and on the expert opinions which are included in the assessment of the Dissertation.

(10) ¹If only one reviewer recommends rejection of the Dissertation (assessment with a grade of 4 = insufficient), the Doctoral Degree Committee shall arrange for the Dissertation to be re-examined by a further reviewer, who shall be a professor or hold an equivalent position at a research institution and fulfill the professional requirements specified in Section 16. ²Subsection 8 shall apply accordingly in this case. ³The final decision on the rejection of a Dissertation shall be made by the Doctoral Degree Committee. ⁴If the Dissertation is rejected, the Doctoral Candidate shall receive a written or electronic notification with information on legal remedies. ⁵A rejected thesis shall remain in the Faculty's files together with all reviews.

§ 10 Disputation

(1) ¹The disputation is an oral examination in which the Dissertation is defended before an examination committee. ²The Disputation takes place after the Dissertation has been accepted in accordance with § 9 subsection 9.

(2) ¹The examination committee is appointed by the Doctoral Degree Committee in accordance with § 16. ²As a rule, the examination committee consists of the two reviewers of the Dissertation in accordance with § 9 subsection (1) as examiners and a member of the group of professors of the Faculty of Mathematics and Natural Sciences who works full-time at the University of Cologne as chairpersons. ³An assessor pursuant to § 16 subsection (3) shall also take part in the disputation and take the minutes. ⁴Any other reviewer appointed in accordance with § 9 subsections (2), (3), (4) and (10) and, if applicable, a further person in accordance with subsection (3) may also be members of the examination committee as examiners. ⁵The members of the examination committee must fulfill the requirements set out in § 16.

(3) ¹The Chairperson of the Doctoral Degree Committee or his/her deputy shall have the right to participate in each disputation as an additional examiner of the examination committee. ²As a rule, he or she shall exercise this right when when the disputation is retaken.

(4) ¹The Disputation shall be held in German or English. ²The language shall be chosen by the Doctoral Candidate. ³If the Doctoral Candidate or a member of the examination committee does not speak sufficient German or English, the Disputation shall be conducted in the language that all participants speak sufficiently well. ⁴The Disputation shall generally take place in presence. ⁵The Chair of the examination committee may decide that it is to take place in part or in full in electronic form, for example if it is unreasonable to expect an examiner or the Doctoral Candidate to travel to the venue.

(5) ¹The Disputation begins with a presentation by the Doctoral Candidate of approximately 20 minutes on the Dissertation. ²This is followed by a colloquium in which only the members of the examination committee are entitled to ask questions. ³Based on the presentation and the factual and methodological foundations of the Dissertation, the colloquium shall also cover areas of the doctoral subject related to the Dissertation topic. ⁴The disputation lasts at least one hour and at most one and a half hours.

(6) ¹The oral Disputation is open to the university public unless the Doctoral Candidate or the advisor objects. ²The Doctoral Candidate may also object to the participation of individual persons as listeners. ³The disputation shall be announced on a notice board or in an online portal of the Department or faculty. ⁴The Chair of the examination committee shall allow an appropriate number of members of the audience to attend. ⁵With the consent of the Doctoral Candidate, the chairperson may admit members of the audience from outside the University. ⁶The members of the Doctoral Degree Committee shall have the right to attend the Disputation as members of the audience. ⁷The members of the audience have no right to participate. ⁸The chairperson of the examination committee may exclude members of the audience if the proper conduct of the oral Disputation appears to be jeopardized. ⁹The reasons for this must be noted in the minutes.

§ 11

Assessment of the Disputation

(1) ¹After completion of the Disputation, the examination committee shall withdraw for a closed meeting. ²The examination committee shall set a grade for the Disputation in accordance with § 12.

(2) ¹Each examiner and the chairperson shall propose a grade in accordance with § 12, from which the final grade for the Disputation shall then be calculated by the chairperson of the examination committee in accordance with § 12 (2).

(3) ¹The Disputation is failed if the grade is 3.5 or worse or if at least half of the grades proposed by the examiners and the chairperson are "4" (= not sufficient, insufficiens).

(4) ¹If a Doctoral Candidate does not attend the Disputation without a valid reason to be proven by him or her, or if he or she terminates the Disputation prematurely, it shall be deemed to have been failed.

(5) ¹The Doctoral Candidate shall be informed of the assessment orally without delay. ²If the Disputation has not been passed, the Doctoral Candidate shall also be informed of this in writing or electronically by means of a notification, which shall include information on legal remedies.

(6) ¹A failed disputation may be repeated once within six months. ²If the repetition is not passed or if it is not taken on time for reasons for which the Doctoral Candidate is responsible, the doctorate is irreversibly failed.

(7) ¹The minutes of the Disputation shall be sent by the chairperson of the examination committee to the doctoral office and filed in the doctoral files.

(8) ¹The chairperson is responsible for the proper conduct of the Disputation. ²The persons involved in the Disputation are obliged to inform the Doctoral Degree Committee in the event of doubts about the correctness of the Disputation and its assessment.

§ 12

Assessment of the Dissertation and Disputation and overall grade of the doctorate

(1) ¹The following grades are to be used for the assessment of the Dissertation and the Disputation:

0 = with distinction (summa cum laude): with exceptionally high academic achievement

1 = very good (magna cum laude): with above-average academic performance

2 = good (cum laude): academic performance that meets average requirements

3 = sufficient (rite): academic performance that still meets the requirements

4 = not sufficient (insufficiens): for academic performance that no longer meets the requirements due to significant deficiencies.

(2) For differentiated assessment, grades 1 to 3 may be increased or decreased by 0.3 or the intermediate values 1.5 and 2.5 may be given. ³The grade 3.3 is excluded.

(2) ¹The grade of the Dissertation or the Disputation is calculated as the arithmetic mean of the proposed grades of all reviewers or all examiners. ²Of this average, only the first decimal place after the decimal point shall be taken into account; all further decimal places shall be deleted without rounding. ³If the Dissertation is rejected in accordance with § 9 subsection (10), it shall be awarded the grade "4" (insufficient, insufficiens). ⁴If the disputation is not passed in accordance with § 11, it shall be assessed with the grade "4" (not sufficient, insufficiens).

(3) ¹The doctorate is passed when the Dissertation has been accepted and the Disputation has been passed. ²The overall grade of the doctorate is calculated as a weighted average of the overall grade of the accepted Dissertation and the overall grade of the passed disputation, whereby the overall grade of the Dissertation is weighted twice and the overall grade of the disputation is weighted once. ³Of this mean value, only the first decimal place after the decimal point shall be taken into account; all further places shall be deleted without rounding.

(4) ¹Grades resulting as averaged values are as follows for
0 = with distinction (summa cum laude)
from 0.1 to 1.4 = very good (magna cum laude)
from 1.5 to 2.4 = good (cum laude)
from 2.5 to 3.4 = sufficient (rite)
from 3.5 to 4.0 = not sufficient (insufficiens).

²The grade "0" (with distinction, summa cum laude) shall only be awarded for the Dissertation and the Disputation if all reviewers of the Dissertation or all examiners and the chairperson of the Disputation have proposed this.

³If both the disputation and the Dissertation have been assessed with the grade "0" = "with distinction", the overall grade of the doctorate shall be "with distinction / summa cum laude".

§ 13

Publication of the Dissertation

(1) ¹After passing the doctorate, the Doctoral Candidate must publish the Dissertation in an appropriate form. ²Chapters that have already been published or accepted for publication may be replaced by a reference, if possible with a DOI (Digital Object Identifier) number. ³If the Dissertation refers to further data, these should be accessible on scientific data servers or in publications.

(2) ¹Publication may take place in the following forms at the University and City Library of Cologne in accordance with its regulations:

- a) in electronic form on the University server KUPS;
- b) by private printing and delivery of bound copies;
- c) in a publishing house with ISBN or ISSN and delivery of bound copies.

²The publication must contain a note on the title page or on the back of the title page stating that it is a Dissertation accepted by the Faculty of Mathematics and Natural Sciences of the University of Cologne; the year of the disputation must be stated. ³In cases (b) and (c), electronic versions of the Dissertation summary in German and English must be published on the University server KUPS. ⁴The publication of the Dissertation via KUPS may be subject to an embargo period of up to 2 years, provided that this option is offered by the University and City Library of Cologne.

(3) ¹An electronic version (PDF/A file) of the published version of the Dissertation must also be submitted to the Doctoral Office.

(4) ¹The Dissertation must be published within one year of passing the Disputation. ²This deadline may be extended by one year upon justified request. ³In exceptional cases, the deadline may be extended beyond 2 years by a further year in each case, but to a maximum of 5 years, upon justified request. ⁴Good cause exists in particular if the Dissertation or parts of the Dissertation have been accepted for publication by a journal or publisher and prior publication of these parts is not permitted under the underlying contract, or if this is necessary to protect intellectual property, because otherwise the registration of intellectual property rights would be jeopardized, publication depends on the consent of third parties or scientific data directly related to the Dissertation is to be published in another way first.

§ 14

Certificate, Provisional Authorization to Use the Title, and Award of the Doctoral Degree

(1) ¹Upon successful completion of the doctorate pursuant to § 12, the doctoral process is concluded, and the Doctoral Candidate receives a certificate signed by the Dean and bearing the seal of the Faculty as well as the date of the disputation. ²This certificate includes the title of the Dissertation, the overall grades of the Dissertation and the disputation, the overall grade of the doctorate, the names of the reviewers and of the members of the examination committee, as well as the date of the disputation as the final examination performance. ³The certificate does not entitle the holder to bear the Doctoral Degree.

(2) ¹After publication of the Dissertation in accordance with § 13, the graduate receives a certificate of conferment of the Doctoral Degree, executed on the date of the disputation, signed by the Dean and bearing the seal of the Faculty. ²This certificate states the title of the Dissertation as well as the overall grade of the doctorate pursuant to § 12. ³Upon presentation of the certificate, the doctorate is officially conferred. ⁴Prior to presentation of the certificate, the Doctoral Degree may not be used.

(3) ¹Upon request, the Doctoral Candidate may be granted permission to use the Doctoral Degree provisionally before the mandatory electronic copy according to § 13 subsection (3) has been submitted. ²This requires that the Dissertation is ready for publication and that an important reason, in accordance with § 13 (4), impedes the publication of the Dissertation and is proven. ³The permission is valid for a period of two years after completion of the doctorate. ⁴It may be revoked if the Doctoral Candidate unduly delays or renders impossible the publication of the Dissertation through their conduct. ⁵In exceptional cases, upon request, the permission may be extended for one additional year at a time, but for a maximum of five years.

§ 15

Advisors of Doctoral Projects

(1) ¹Advisors of doctoral projects must hold a doctorate in a subject from mathematics or natural sciences or a subject closely related to the doctoral project, have demonstrated particular scientific research achievements beyond the Dissertation, and meet the requirements for the right to supervise doctorates as set out in (2) to (10).

(2) ¹Professors and full-time private lecturers employed at the University of Cologne who are members of the Faculty of Mathematics and Natural Sciences and who meet the requirements of (1) may supervise doctoral projects. ²This also applies to non-full-time private lecturers of the Faculty of Mathematics and Natural Sciences at the University of Cologne, provided they meet the requirements of (1) and can demonstrate scientific research achievements in the form of publications or patents for the last five years.

(3) ¹Professors who are members of other faculties of the University of Cologne may, upon application, be granted the right to supervise doctoral projects in a doctoral subject if they fulfill the requirements of (1) and if the granting of supervision rights is endorsed by the Department representing the doctoral subject. ²This right may be granted with restrictions, for example on a case-by-case basis, for a specified period, under the condition that an appraisal regarding the academic classification of the doctoral project according to § 4 subsection (1) exists, or that it is undertaken within a Graduate School of a Department of the faculty. ³The right may furthermore be limited to doctoral projects that are carried out at

the academic institution where the professor is employed full-time, or that are conducted under the direct supervision in the professor's research group.

(4) ¹Professors who are members of other universities and who meet the requirements of (1) may, upon application, be granted the right to supervise doctorates if they are members of a graduate program/graduate college jointly established and funded with an academic institution of the Faculty of Mathematics and Natural Sciences. ²This right is generally granted with restrictions to supervise doctoral projects that are carried out as part of the coordinated graduate program or graduate college and are co-supervised by a professor of the Faculty of Mathematics and Natural Sciences.

(5) ¹Independent group leaders who are employed full-time at the Faculty of Mathematics and Natural Sciences and fulfil the requirements under (1) will generally be granted the right to supervise doctoral projects upon application. ²An independent group leader is employed full-time at an academic institution, conducts independent research, and leads their own research group. ³They have personnel responsibility, budgetary responsibility, the necessary basic equipment and/or access to infrastructure and all necessary resources. ⁴They have been selected in a competitive process and are undergoing qualification for academic leadership positions, primarily for appointment to a professorship. ⁵The right to supervise doctoral projects is generally granted for the duration of employment as a group leader and limited to doctoral projects conducted under the direct supervision of the group leader and embedded in a Graduate School of a Department of the faculty.

(6) ¹Independent group leaders (as per (5), sentences 2 to 4) who are members of other faculties of the University of Cologne or employed at a research institution cooperating with the Faculty of Mathematics and Natural Sciences and meet the requirements of (1) may, upon application, be granted the right to supervise doctoral projects. ²The group leader should be a member of an academic institution or a coordinated program jointly established or supported by an academic institution of the Faculty of Mathematics and Natural Sciences. ³This right is generally granted for a limited period corresponding to the period of employment as a group leader and restricted to doctoral projects conducted under the direct supervision of the group leader and in a Graduate School of a Department of the faculty.

(7) ¹The right to supervise doctoral projects can only be exercised in one of the doctoral subjects (Appendix 1), unless otherwise decided in an appointment or habilitation process (e.g., interdisciplinary subject designation or granting of the *venia legendi* for two doctoral subjects) or by a decision of the Doctoral Degree Committee in individual cases. ²The right to supervise doctoral projects may be extended by the Doctoral Degree Committee to an additional doctoral subject, provided this is endorsed by the Department(s) representing the doctoral subject.

(8) ¹The right to supervise doctoral projects pursuant to (2) may be continued by professors of the Faculty of Mathematics and Natural Sciences for up to three years following appointment to another faculty, University or research institution, or upon retirement, for the supervision of doctoral projects already commenced. ²The right to supervise doctoral projects pursuant to (3) to (6) may, upon application, be extended for up to three years in individual cases if duties change, employment changes, or upon retirement, for the supervision of already commenced doctoral projects.

(9) ¹In the case of joint research projects or cooperation with universities of applied sciences, a professor from the University of applied sciences is involved in the supervision of the Doctoral Candidate.

(10) ¹The advisor is obliged to observe the rules of good scientific practice and to support the Doctoral Candidate in adhering to the rules of good scientific practice.

§ 16

Reviewers, Examiners, Chairs, and Members of Examination Committees

(1) ¹Reviewers, examiners, and chairs of examination committees must meet the requirements set out in (2) to (8).

(2) ¹Persons authorized to supervise according to § 15 may serve as reviewers and examiners.

(3) ¹Additional reviewers and examiners are generally professors or hold equivalent positions at a research institution. ²Junior professors who have demonstrated particular scientific achievements beyond the Dissertation may also serve as reviewers and examiners. ³Reviewers and examiners should be familiar with the German doctoral examination process.

(4) ¹Members of examination committees must hold a doctorate in a subject from mathematics or natural sciences or a subject closely related to the doctoral subject. ²They are generally employed at the University of Cologne or at the research institution of the advisor of the doctoral project.

(5) ¹The chair of the examination committee is employed full-time at the University of Cologne, is a member of the group of professors of the Faculty of Mathematics and Natural Sciences, and is neither retired nor in retirement. ²The chair belongs to an institute other than that of the Doctoral Candidate and their advisor, or holds the right to supervise in a different doctoral subject than that of the doctoral project. ³The chair may not be a cooperation partner or co-author of a publication or planned publication of the Doctoral Candidate in connection with the doctoral project.

(6) ¹When appointing reviewers, examiners, chairs of examination committees, and committee members, the principles of the University of Cologne regarding questions of possible conflicts of interest with respect to the Doctoral Candidate must be observed. ²Furthermore, with respect to reviewers, examiners, chairs, and committee members, the general exclusion criteria according to the principles of the University of Cologne regarding conflicts of interest must be observed with regard to one another.

(7) ¹The advisor of the doctoral project of the Doctoral Candidate according to § 5 may, upon application by the Doctoral Candidate, serve as reviewer, examiner, or assessor. ²For doctorates in cooperation with a University of applied sciences according to § 18, and for doctorates in cooperation with a foreign University according to § 19, the second advisor may also serve as reviewer and examiner. ³In the cases described in sentence 2, at least one additional reviewer and examiner must be appointed. ⁴Additional reviewers and examiners may not be cooperation partners or co-authors of a publication or planned publication of the Doctoral Candidate in connection with the doctoral project and must belong to a different research group than the Doctoral Candidate, the advisor, and the first reviewer.

(8) ¹When appointing one or more additional reviewers (according to § 9 subsections 3, 4, 9, and 10), in addition to the standard exclusion criteria according to the principles of the University of Cologne regarding conflicts of interest, there must not have been close scientific or commercial collaborations within the last six years with the Doctoral Candidate or the advisor(s) of the doctoral project.

§ 17

Ombudsperson

(1) ¹The Faculty Council elects an ombudsperson and a deputy. ²The ombudsperson must be a tenured professor. ³Re-election is permitted. ⁴If the ombudsperson leaves office or resigns, a new ombudsperson is elected. ⁵If the deputy leaves office or resigns, a new deputy is elected.

(2) ¹The ombudsperson and their deputy are trusted contacts for Doctoral Candidates in conflict situations arising in connection with their doctoral studies or doctorate.

§ 18

Doctoral Procedures with a Foreign University (Cotutelle)

(1) ¹A joint doctoral procedure with a foreign University provides for joint supervision of the doctoral project, joint evaluation of the Dissertation, as well as a joint Disputation in a manner that meets the requirements of the doctoral regulations of the Faculty of Mathematics and Natural Sciences of the University of Cologne and the partner foreign University.

(2) ¹The conditions of the joint doctoral project can either be stipulated by a framework agreement or by an individual agreement between the Faculty of Mathematics and Natural Sciences of the University of Cologne and the foreign University. ²Such agreements must be approved by the Doctoral Degree Committee. ³Unless otherwise specified in the agreement, the doctoral regulations valid at the time of conclusion of the agreement apply.

(3) ¹The agreement according to (2) should regulate the following matters, which may supersede provisions of these doctoral regulations:

- a) the advisors of the Doctoral Candidate by the Faculty of Mathematics and Natural Sciences according to § 15 and by the partner University;
- b) the minimum periods of stay of the Doctoral Candidate at the partner institutions and the financing of research stays and travel;
- c) enrollment at the University of Cologne or the partner University;
- d) the sequence of examination performances, i.e. Dissertation and Disputation, and the language in which they are to be provided;
- e) general provisions for the appointment of reviewers of the Dissertation;
- f) general provisions for the composition of the examination committee for the Disputation;
- g) the assessment of the doctoral achievements (Dissertation and Disputation), whereby the participating universities generally apply their own grading systems, even if these are different;
- h) the publication of the Dissertation;
- i) the joint doctoral certificate of the participating universities or the respective certificates of the participating universities.

(4) ¹Admission to the joint doctoral program with a foreign University requires that the applicant fulfills the admission requirements for doctoral studies according to § 4 at the

Faculty of Mathematics and Natural Sciences of the University of Cologne, and that upon registration of the doctoral project, the evidence required by the agreement is submitted.

(5) ¹After successful completion of the doctorate and publication of the Dissertation, a joint, possibly multilingual doctoral certificate is usually issued, indicating the joint doctoral program at the University of Cologne and the foreign partner University and specifying the jointly awarded Doctoral Degree or the Doctoral Degree to be used in the respective country, which is signed and sealed by both cooperation partners. ²If a joint doctoral certificate cannot be issued, two certificates referring to the binational doctoral program will be issued, which are only valid together and which indicate that only one Doctoral Degree is awarded, which may be used either in the German form or in that of the foreign partner University.

§ 19

Joint Doctoral Procedure with a German University of Applied Sciences

(1) ¹The Faculty of Mathematics and Natural Sciences of the University of Cologne, in cooperation with German universities of applied sciences, develops doctoral programs as per § 67 HG, in which the performance of doctoral achievements is jointly supervised.

(2) ¹Admission to the joint doctoral program with a German University of applied sciences requires prior admission according to § 4 to doctoral studies at the Faculty of Mathematics and Natural Sciences of the University of Cologne. ²Admission to the joint doctoral program then takes place by mutual declarations of intent by the Faculty of Mathematics and Natural Sciences of the University of Cologne and the German University of applied sciences.

(3) ¹The conditions of the joint doctoral program are determined for each individual case in an agreement between the Faculty and the University of applied sciences. ²Such agreements must be approved by the Doctoral Degree Committee.

(4) ¹Joint doctoral procedures with universities of applied sciences are conducted in accordance with the provisions of these doctoral regulations at the Faculty of Mathematics and Natural Sciences of the University of Cologne. ²Individual provisions of these doctoral regulations may be replaced by equivalent regulations recorded in the agreement. ³Such replacement of regulations is subject to approval by the Doctoral Degree Committee.

§ 20

Deception, Breach of Regulations

(1) ¹If the Doctoral Candidate attempts to influence the evaluation of any examination performance according to these regulations by deception for their own or others' advantage, brings unauthorized aids into the examination, or commits scientific misconduct during the examination performance, they commit an act of deception.

(2) ¹Depending on the severity of the deception act under (1), the Doctoral Degree Committee shall impose one of the following sanctions on the Doctoral Candidate:

- a) the candidate is required to repeat the examination performance to which the deception relates;
- b) the examination performance to which the deception relates is graded as "insufficient (4.0)" or "failed";
- c) the examination to which the deception relates is permanently failed;

d) the candidate is excluded from performing further examination performances, thereby forfeiting the right to examination in the doctoral program.

²A serious breach is particularly considered in cases of using unauthorized aids, (attempted) influence on reviewers or examiners, or, in cases of plagiarism, where sources are deliberately concealed by paraphrasing original texts, rearranging syntax, or using synonyms. ³An especially severe case is considered in particular when a foreign work is taken as one's own, scientific works are falsified, or examination, final theses, or research activities of others are sabotaged. ⁴The chosen sanction shall be recorded in the doctoral file. ⁵In cross-University doctoral programs and examinations, other involved universities may additionally be informed.

(3) ¹If there is an initial suspicion of plagiarism in the Dissertation or Disputation, the Doctoral Degree Committee may conduct further investigations, especially using plagiarism detection software, without the explicit consent of the Doctoral Candidate. ²Storage of data in plagiarism detection software databases beyond the end of the respective evaluation procedure requires explicit consent of the Doctoral Candidate. ³Consent must be given voluntarily and is not a prerequisite for registration, submission, or evaluation of the examination. ⁴The result of the review shall be stored as part of the doctoral file. ⁵The Doctoral Degree Committee may also check randomly selected samples. ⁶The method of sample selection must be documented.

(4) ¹Before a decision by the Doctoral Degree Committee, the Doctoral Candidate must be given the opportunity to be heard. ²The decision is to be communicated to the Doctoral Candidate immediately in writing or electronically, justified, and accompanied by information on legal remedies.

(5) ¹Additionally, an administrative offense procedure pursuant to § 63 (5) HG may be initiated. ²An administrative offense is also committed by anyone who intentionally attempts to influence the result of an examination performance for someone else's benefit.

§ 21

Revocation and Non-awarding of the Doctoral Degree, Annulment of the Doctorate, and Withdrawal of Admission to Doctoral Studies

(1) ¹The Doctoral Degree may be revoked, awarding of the Doctoral Degree may be withheld, the doctorate may be graded "insufficient," and admission as a Doctoral Candidate may be withdrawn,

a) if it is subsequently revealed that the Doctoral Candidate or graduate intentionally deceived regarding the essential requirements for admission to doctoral studies or to the doctoral examination;

b) if it is subsequently revealed that the Doctoral Degree was obtained by false information about essential requirements of the doctorate or by deception;

c) if it is subsequently revealed that the graduate was guilty of deception in completing the doctoral achievements;

d) if the competent body of the University of Cologne has established scientific misconduct in connection with the Dissertation.

(2) ¹If circumstances become known that may justify revocation or non-awarding of the Doctoral Degree, grading the achievements "insufficient," or withdrawal of admission according to (1), the Faculty Council shall decide. ²The graduate or Doctoral Candidate shall

be given an opportunity to comment beforehand. ³The Doctoral Degree Committee shall be heard prior to the decision. ⁴The resolution shall be made within one year of becoming aware of the facts justifying non-awarding or revocation. ⁵If the doctorate was awarded with the cooperation of a foreign partner University, the decision on revocation is made jointly with their involvement. ⁶The provisions of the Administrative Procedure Act for the State of North Rhine-Westphalia (VwVfG NRW) shall apply to this procedure.

(3) ¹Following the decision on revocation, the doctoral certificate and the certificate pursuant to § 14 shall be declared invalid and withdrawn.

§ 22

Doctoral File, Right of Inspection, and Retention Periods

(1) ¹A doctoral file is kept for each Doctoral Candidate. ²The doctoral file documents in particular the registration and admission to doctoral studies, registration and admission to the doctoral examination, the Dissertation and the reviews of the Dissertation, the examination committee for the Disputation, the Disputation protocol, the evaluation of Dissertation and Disputation as well as the calculation of the overall grade, proof of publication of the Dissertation, and copies of certificates and diplomas. ³The doctoral file is maintained either in paper form or wholly or partly electronically.

(2) ¹After the announcement of the evaluation of the Dissertation and Disputation, the Doctoral Candidate or an authorized representative may request in writing or electronically to inspect the written or electronically prepared performances and related reviews in these examinations as well as the Disputation protocols. ²During inspection, the Doctoral Candidate or their representative must be allowed to make copies or photographs of the documents. ³The inspection request must be submitted to the doctoral office of the deanery. ⁴The place and time of inspection will be determined by the office.

(3) ¹The doctoral file and data collected pursuant to the University of Cologne's matriculation regulations in their respective current versions are retained in the event of discontinuation of the doctorate until the end of the third year following discontinuation and in case of successful completion of the doctorate until the end of the fifth year following completion, after which they are offered to the responsible archive; if the archive rejects acceptance, the file must be destroyed. ²A listing may retain awarded academic degrees and a catalogued collection of the doctoral study period, date of certificate issuance, supervision details, Dissertation reviews, examination committee members, and issued certificates and diplomas until the end of the fiftieth year after completion; the second half of sentence 1 applies accordingly. ³In case of discontinuation, a catalogued collection of the doctoral study period and supervision details may be kept until the end of the tenth year following discontinuation; the second half of sentence 1 applies accordingly.

§ 23

Compensations for Disadvantages and Protection Provisions

(1) ¹The special concerns of Doctoral Candidates with disabilities, chronic or mental illnesses, and Doctoral Candidates subject to maternity protection provisions shall be taken into account to ensure equal opportunities.

(2) ¹If a Doctoral Candidate credibly demonstrates that due to long-lasting or permanent illness or disability they are unable to participate in the doctoral study program or examination performances in the prescribed form or extent, a compensation for

disadvantages shall be granted upon written or electronic application to the chair of the Doctoral Degree Committee. ²A specialist medical certificate may be required. ³This also applies with respect to deadlines, dates, and participation obligations in the doctoral study program. ⁴The application should be submitted as soon as possible after the conditions arise.

(3) ¹Utilization of protection provisions pursuant to Maternity Protection Law and according to deadlines of the Federal Parental Allowance and Parental Leave Act in its respective current version is enabled upon written or electronic application to the chair of the Doctoral Degree Committee. ²Participation in the doctoral program and examinations is possible despite leave. ³The application should be submitted as soon as possible after the conditions arise.

(4) ¹Special concerns arising from the need to care for or support spouses, registered partners, relatives in a direct line, or relatives by marriage in the first degree must be taken into appropriate account, especially regarding deadlines and dates. ²The application should be submitted as soon as possible after the conditions arise.

(5) ¹Applications pursuant to (1) to (4) must be comprehensively justified by the Doctoral Candidate with appropriate evidence. ²Applications should be submitted within a reasonable period before the achievement is to be completed to the chair of the Doctoral Degree Committee. ³Unless changes in the illness or disability can be expected, the compensation should cover all obligations throughout the doctoral studies.

§ 24 Transitional Provisions

(1) ¹These doctoral regulations apply to all who have applied for admission to doctoral studies after these regulations come into effect.

(2) ¹These doctoral regulations also apply to all Doctoral Candidates admitted before these regulations came into force. ²For candidates admitted under the doctoral regulations of 2 February 2006 (Official Bulletins 17/2006), last amended by regulations of 21 April 2014 (Official Notices 05/2014), who have timely objected to the change to the doctoral regulations of 12 March 2020 (Official Bulletins 08/2020), the obligation to provide proof pursuant to § 7 (2) c) does not apply upon registration for the doctoral examination procedure.

³For candidates admitted under the doctoral regulations of 12 March 2020, the obligation to provide proof pursuant to § 6 (2) and § 7 (2) c) upon registration for the doctoral examination procedure is limited to proof of membership in the Graduate School (members) or attendance of a course on good scientific practice (non-members of the Graduate School).

§ 25 Entry Into Force

These doctoral regulations shall be published in the Official Notices of the University of Cologne and shall enter into force on 1 July 2025.

Upon entry into force, the doctoral regulations of 2 February 2006 (Official Bulletins 17/2006), last amended by the regulation of 21 April 2014 (Official Bulletins 05/2014), and of 12 March 2020 (Official Notices 08/2020) shall expire.

Upon entry into force, enrollment shall only be possible in the doctoral study programs listed in Appendix 1.

For enrollment in the doctoral study programs Biological Sciences, Geology/Paleontology,

Geophysics, Meteorology, Mineralogy/Crystallography, and Mathematical Economics, the change of enrollment must occur within five years.

Issued pursuant to the resolution of the Faculty of Mathematics and Natural Sciences of 24 April 2025 and after legal review by the Rectorate of the University of Cologne of 10 June 2025.

Cologne, 11 June 2025

The Dean of the Faculty of Mathematics and Natural Sciences of the University of Cologne
[signed]

Univ.-Prof. Dr. Georg Bareth

Appendix 1

Explanation: The allocation of the doctoral subjects to one or more subject areas represented by the Departments according to § 4 (1) and the enrollment at the University of Cologne is established as follows:

Doctoral Subject	Subject Area and Department	Study Course
	Biology Chemistry and Biochemistry Didactics of Mathematics and Natural Sciences Geosciences Mathematics / Computer Science Physics	
Biology	x	Biology
Computational Biology	x	
Biochemistry	(x) x	Biochemistry
Chemistry	x	Chemistry
Biology Education	x	Didactics of Mathematics and Natural Sciences
Chemistry Education	x	
Geography Education	x	
Primary Science and Social Sciences Education	x	
Mathematics Education	x	
Physics Education	x	
Environmental Sciences	(x) x	Environmental Sciences
Geography	x	Geography
Geology and Mineralogy	x	Geosciences
Crystallography	x	
Geophysics	x	Geophysics and Meteorology
Meteorology	x	
Applied Mathematics	x	Mathematics
Pure Mathematics	x	
Computer Science	x	Computer Science
Biophysics	(x) (x)	Biophysics
Experimental Physics	x	Physics
Theoretical Physics	x	

a) An "x" indicates the Department to which the doctoral subject is primarily assigned. The doctoral subjects of biochemistry, biophysics, and environmental sciences are also represented by advisors from other Departments; these are marked with "(x)".