Doctoral Regulations

for the Faculty of Mathematics and Computer Science

of Julius-Maximilians-Universität Würzburg (JMU)

of 9 October 2019

(Available for download from: http://www.uni-wuerzburg.de/amtl_veroeffentlichungen/2019-49)

On the basis of Article 13 Subarticle 1 and Article 64 Subarticle 1 *Bayerisches Hochschulgesetz* (Bavarian Higher Education Act, BayHSchG) dated 23 May 2006 (*Bayerisches Gesetz- und Verordnungsblatt* (Bavarian Law and Ordinance Gazette, GVBl, p. 245, *Bayerische Rechtssammlung* (Collection of Bavarian Laws, BayRS) 2210-1-1-WFK) last amended by Section 1 of the Act dated 13 December 2016 (*Bayerisches Gesetz- und Verordnungsblatt* (Bavarian Law and Ordinance Gazette, GVBl, p. 369) Julius-Maximilians-Universität Würzburg (JMU) issues the following

Regulations for the Attainment of the Degree of Doctor of Natural Sciences (Doctoral Regulations) of the Faculty of Mathematics and Computer Science

Contents

Part I. General Provisions

Section 1
General Principles

(1)   On behalf of the University of Würzburg, the Faculty of Mathematics and Computer Science confers the degree of Doctor of Natural Sciences (Dr. rer. nat.) through a regular doctoral examination procedure on the basis of the following provisions or as an honorary doctorate (Dr. rer. nat. h. c.).

(2)   Through the regular doctoral examination procedure, candidates demonstrate their ability for deeper and independent academic work in their chosen scientific field, which considerably exceeds the requirements of Bachelor's and Master's examinations and of State Examinations. A person may be awarded the same doctoral degree through a regular doctoral examination procedure only once.

(3)   In the case of binational doctoral examination procedures that are the outcome of corresponding cooperation agreements with universities in other countries, a doctoral degree may also be awarded only once, together with the university abroad. The contractual arrangements of such agreements require the approval of the Doctoral Committee.

(4)   The honorary degree of Doctor of Natural Sciences may be conferred as an exceptional distinction on individuals who have rendered outstanding scientific services in one or more of the subject areas represented at the Faculty of Mathematics and Computer Science.

Section 2
Doctoral Achievements

Doctoral candidates shall demonstrate their particular academic performance through specific doctoral achievements. These are:

1.   A written paper (dissertation, Section 9) and
2.   An oral examination (Section 11).

Section 3
Doctoral Committee

(1)   The Doctoral Committee is responsible for conducting the doctoral examination procedure. The committee comprises:

(a)   All full-time university teachers at the Faculty of Mathematics and Computer Science,
(b)   Other members of the Faculty Board who hold a doctoral degree,
(c)   All other members of the Faculty of Mathematics and Computer Science with *Habilitation*, provided they are full-time members of staff and authorised to teach.

(2)   The Dean shall chair the Doctoral Committee or, should he/she be incapacitated or personally involved, the Vice Dean.

(3)   The Doctoral Committee may delegate individual tasks to the chairperson in a manner revocable at any time.

(4)   The Doctoral Committee is quorate if all members have been summoned by proper invitation, i.e. in writing with a period of notice of six working days and including the agenda, and if the majority of the members are present and entitled to vote. It shall decide on the basis of the majority of the votes cast; abstentions, secret ballot and transfer of voting rights are not permitted. In the event of a tie, the chairperson shall have the casting vote. Minutes shall be recorded of all resolutions.

(5)   All decisions in a doctoral examination procedure shall be made immediately and the candidate notified promptly in writing or in electronic form. Detrimental decisions must be justified in writing and include instructions on the legal remedies available.

(6)   In the case of decisions in accordance with Section 10 Subsections 3 to 10, only those members of the Doctoral Committee may participate who are university teachers within the meaning of Article 2 Subarticle 3 Sentence 1 *Bayerisches Hochschulpersonalgesetz* (Bavarian Higher Education Employment Act, BayHSchPG).

Section 4
Reviewers and Examiners

(1)   The chairperson may appoint all persons entitled to conduct doctoral examinations as reviewers and examiners in a doctoral examination procedure, in accordance with the *Hochschulprüferverordnung* (Higher Education Examiners Act, HSchPrüfV) in the respective applicable version. These include:

- (a)   All full-time university teachers at the Faculty of Mathematics and Computer Science, such as professors, junior professors, private lecturers and groups of persons specified in accordance with the Higher Education Examiners Act (HSchPrüfV),
- (b)   Associate professors employed at the Faculty of Mathematics and Computer Science and professors with an honorary professorship or affiliate membership at the Faculty of Mathematics and Computer Science,
- (c)   University teachers of the faculty up to five years after leaving the University of Würzburg.

(2)   Should the dissertation touch to a significant degree on a subject area that is not represented at the faculty to the extent necessary for its proper review, university teachers from other faculties or other universities may be appointed as reviewers and examiners, as persons authorised to conduct doctoral examinations in accordance with the Higher Education Examiners Act (HSchPrüfV) in the respective applicable version.

(3)   In the case of doctoral examination procedures conducted in cooperation with universities of applied sciences, in addition to the reviewers and examiners indicated in Section 5 Subsection 1 professors from universities of applied sciences may also function as reviewers and examiners. In this case, at least one member of the Faculty of Mathematics and Computer Science with *Habilitation*, a professor employed at the Faculty of Mathematics and Computer Science within the meaning of Article 17 Subarticle 2 Sentence 1 Number 1 Bavarian Higher Education Act (BayHSchG) or an emeritus or retired professor of the Faculty of Mathematics and Computer Science within the meaning of Article 17 Subarticle 1 Sentence 2 Bavarian Higher Education Act (BayHSchG) shall be appointed as a further reviewer and examiner.

(4)   With regard to exclusion on the grounds of personal involvement, Article 41 Subarticle 2 Bavarian Higher Education Act (BayHSchG) shall apply.

Part II. Doctoral Examination Procedure

Section 5
Admission as Doctoral Candidate

(1)   Eligible for admission as doctoral candidates are applicants who have successfully completed one of the following with an above-average performance:

- a)   *Diplom* or Master's examination in a university programme in which mathematics or computer science is a central component, or
- b)   Erste Staatsprüfung für das Lehramt an Gymnasien (state examination for teaching at state schools (Gymnasien)) with mathematics or computer science as the specialist subject, or
- c)   Master's examination in a degree programme at a university of applied sciences in which mathematics or computer science is a central component, or
- d)   Erste Staatsprüfung für das Lehramt an Grund-, Haupt-, Mittel- oder Realschulen (state

examination for teaching at state schools (Grund-, Haupt-, Mittel- oder Realschulen)) with mathematics or computer science as a non-specialist subject, or

e) *Diplom* examination in a degree programme at a university of applied sciences or the Bachelor's examination in a degree programme at a university or a university of applied sciences in which mathematics or computer science is a central component.

An above-average performance is then the case when applicants have obtained an overall grade of at least 2.5 or at least "Good" in the final examination. Evidence of applicants' above-average performance can otherwise be produced through academic achievements in the shape, for example, of publications produced after their studies; the chairperson shall decide accordingly in such cases.

In cases of doubt, applicants may be required to complete certain examinations within the period of one year in order to be admitted. These examinations are specified by the chairperson based on the principle that applicants should make up for and produce evidence of missing components. The chairperson shall decide on the type and scale of these examinations and, in cases of doubt, shall action a decision in consultation with the Doctoral Committee.

(2) Applicants who fulfil the admission requirement indicated in Subsection 1 Sentence 1 Letter d) or e) shall only be admitted if their performance was outstanding. In addition, they must complete two oral examinations lasting 30 minutes each within one year after admission. These examinations should equal material covered in courses on a scale of 20 ECTS credits each in the Master's degree programme in the subject in which doctoral studies are being undertaken. The examinations must be taken with different examiners and may be repeated at most once. The examinations must be registered beforehand and in writing with the chairperson of the Doctoral Committee. A record of the examination proceedings shall be kept, which is signed by the examiners. The doctoral candidate is to be notified in writing of the result of the examinations.

(3) The Doctoral Committee may authorise admission on the basis of other *Diplom* or Master's examinations or equivalent examinations. In cases of doubt, applicants may be required to complete certain examinations within the period of one year in order to be admitted. These examinations are specified by the chairperson based on the principle that applicants should make up for and produce evidence of missing components. The chairperson shall decide on the type and scale and, in cases of doubt, shall action a decision in consultation with the Doctoral Committee. Academic achievements (coursework and examinations) accomplished at universities outside the jurisdiction of the Basic Law for the Federal Republic of Germany are to be recognised as meeting the admission requirements, unless there are considerable differences with regard to the learning outcomes in the qualifications indicated in Subsection 1. In cases of doubt, the Central Office for Foreign Education can be consulted. Decisions on the recognition of academic achievements shall lie with the Doctoral Committee.

Section 6
Acceptance as Doctoral Candidate

(1) In line with the Framework Regulations for Doctoral Studies of the University of Würzburg in the respective applicable version, doctoral studies commence with the applicant's acceptance as doctoral candidate by the Faculty of Mathematics and Computer Science at the beginning of the doctorate. A corresponding application, the application for admission to doctoral studies, must be addressed and submitted in writing to the Faculty of Mathematics and Computer Science before commencing the work. It shall include:

(a) A copy of the Supervision Agreement in accordance with the Framework Regulations for Doctoral Studies of the University of Würzburg in the respective applicable version,

(b) Certificates as certified copies or through presentation of the original and submission of corresponding copies as evidence of the qualification obtained at a university or university of applied sciences together, if applicable, with academic progress certificate, transcript of records, diploma supplement, academic record with enrolment and course certificates (*Studienbuch*), which show that the requirements in accordance with Section 5 Subsections 1 to 3 are met.

(c) A written declaration by the university teacher confirming that he/she is willing to supervise the doctorate,

(d) Curriculum vitae in German or English with details of the applicant's educational background,

(e) A declaration of whether the applicant has already earned a degree or attempted to earn a degree and whether he/she has already submitted the dissertation within a previous examination procedure.

(2) If applicants are unable, through no fault of their own, to provide the necessary documents in the prescribed manner, the Dean may allow them to produce the required evidence in another form.

(3) Acceptance must be refused if the applicant

(a) Has already been awarded the degree of Doctor of Natural Sciences once on a previous occasion, or

(b) Does not meet the requirements indicated in Section 5 or the requirements are deemed not to have been met, or

(c) Fails to present in full the documents required in accordance with Section 6 Subsection 1, or

(d) Has irrevocably failed the doctoral examination at the Faculty of Mathematics and Computer Science or at a comparable faculty, or

(e) Is undeserving of using the doctor title in accordance with the legal provisions on the use of academic titles.

(4) With the exception of academic records and course certificates, all documents included with the application for admission become the property of the University of Würzburg.

(5) Temporary admission is possible. Upon a duly justified application, temporary admission can be extended.

(6) The chairperson of the Doctoral Committee is responsible for decisions on such applications, insofar as responsibility does not lie with the Doctoral Committee itself.

Section 7
Enrolment

After acceptance, the doctoral candidate is obliged, in accordance with the Framework Regulations for Doctoral Studies of the University of Würzburg in the respective applicable version, to enrol at the University of Würzburg and to notify the faculty accordingly and without delay.

Part III. Doctoral Examination

Section 8
Admission to the Doctoral Examination

(1) Persons may be admitted to the doctoral examination who meet the following requirements:

1. The applicant is admitted as a doctoral candidate at the Faculty of Mathematics and Computer Science,

2. The applicant must have been enrolled for doctoral studies for at least two semesters at the Faculty of Mathematics and Computer Science of the University of Würzburg, unless the Doctoral Committee waives this requirement in particularly justified cases,

3. An applicant who meets the admission requirement indicated in Section 5 Subsection 1 No. 2 Letter d) or e) must have successfully passed the additional examination in accordance with Section 5 Subsection 2 and produced corresponding evidence,

4. The applicant must have independently produced a dissertation.

(2) The application for admission to the doctoral examination must be addressed and submitted in writing to the Faculty of Mathematics and Computer Science. It shall include the following:

(a) Four copies of the dissertation in accordance with the provisions of Section 9 and in an electronic form as specified by the Doctoral Committee.

(b) An assurance under oath that the academic achievements have been accomplished independently, in particular that
    i. The applicant has produced the dissertation independently and clearly marked contents taken from elsewhere,
    ii. The applicant has not been given the opportunity to undertake a doctorate on a commercial basis and, in particular, has not engaged a person or organisation which seeks dissertation supervisors in return for payment,
    iii. The applicant has respected the University of Würzburg's rules concerning good scientific practice.

(c) A declaration on whether
    i. and with which result the dissertation, in full or in part, has already been presented to another faculty with the aim of earning a degree, and
    ii. the applicant has already earned a degree or attempted to earn a degree.

(d) A declaration that
    i. for all illustrations and texts for which the doctoral candidate does not hold the rights of use these have been obtained from the holders of the rights of use and the text passages or illustrations are marked in accordance with legal requirements, and
    ii. in the case of illustrations taken from the internet the corresponding hypertext link has been provided.

(e) A full, detailed, dated and personally signed curriculum vitae with a presentation of the applicant's educational background.

(f) In consultation with the supervisor, a proposal indicating the preferred examiners and, in the event of a viva voce (*Rigorosum*), additional details of the sub-areas in which the applicant wishes to be examined.

(g) A list of all the applicant's published academic works with an electronic version of each publication. Printed copies of the publications are to be submitted at a later date if requested by the Doctoral Committee.

(h) An official certificate of conduct, insofar as the applicant is not or has not been in public service for at least the last three months and is not enrolled as a student at the University of Würzburg.

(i) In the case of a binational doctorate, a copy of the signed cooperation agreement between JMU and the faculties/universities involved in other countries.

(j) If the rights of third parties are affected, corresponding written notification must be submitted to the chairperson of the Doctoral Committee.

(3) Admission is to be refused if a candidate
    (a) Does not meet the requirements specified in Subsection 1, or
    (b) Has not presented in full the documents required under Subsection 2 or the documents presented contain incorrect information, or
    (c) Has already been awarded the degree of Doctor of Natural Sciences once on a previous occasion, or
    (d) Has irrevocably failed this doctoral examination or one of the same kind, or
    (e) Is undeserving of using the doctor title in accordance with the legal provisions on the use of academic titles.

(4) Candidates are permitted to withdraw their application for admission to the doctoral examination once, provided that no final decision has been reached on the acceptance of the dissertation. In this case, a copy of the submitted dissertation is kept at the Office of the Dean of the Faculty of Mathematics and Computer Science. A new application for admission to the doctoral examination may be submitted at the earliest six months after withdrawing the first application.

(5) With the exception of academic records (*Studienbücher*), all documents included with the application for admission to the doctoral examination become the property of the University of Würzburg. This also applies for rejected dissertations and for the original version of dissertations which have been revised in accordance with Section 10 Subsection 7.

(6) The chairperson of the Doctoral Committee shall decide on candidates' admission to the doctoral examination. In cases of doubt, the chairperson may action a decision by the Doctoral Committee. In

the case of a rejection, the applicant may call on the Doctoral Committee to make a final decision.

Section 9
Dissertation

(1) The dissertation is a scholarly paper on a topic from the sphere covered by the Faculty of Mathematics and Computer Science, through which candidates demonstrate their ability to work on scientific problems independently and in a methodically proper manner. It must be free of errors, produced autonomously and lead to new scientific insights. It may not already have been presented in the same, a similar or partial form in other examination procedures and in particular may not be identical to a previously composed *Diplom*, Master's or State Examination admission thesis.

(2) In place of a monographic dissertation as the written part of the doctoral examination, candidates may produce a publication-based dissertation ("cumulative" dissertation). Dissertations by publication are based on the full or partial reproduction of peer-reviewed texts and illustrations published in internationally acknowledged journals or conference proceedings or manuscripts accepted for publication, also in the form of translations, where the doctoral candidate has made a significant contribution as author to the research work and its written documentation (first authorship). In the case of a dissertation by publication, at least three of the publications used for the dissertation should have been written by the doctoral candidate as first author. Deviations from this rule may be decided by the chairperson of the Doctoral Committee in individual cases.
The reproduction of publications or parts thereof in the dissertation must be clearly marked therein in a suitable place by providing the full bibliographical data. Furthermore, any stipulations by the holders of the rights of use must be observed. The doctoral candidate's own contribution to the publications or manuscripts must in any case be declared in the appendix to the dissertation by submitting the relevant form issued by the respective institute. One and the same publication should only be used once for obtaining an academic title or *Habilitation*; the distinction between the respective parts must otherwise be explained. The cumulative part of the dissertation must be prepended by a summary, in which the scientific questions, the problem-solving approaches applied, the results obtained and the conclusions as well as the related literature must be presented.
Submission of a dissertation by publication is only possible with the consent of the respective supervisor.

(3) The dissertation must be presented as a typed manuscript in a quality suitable for reproduction, in A4 format and as an electronic version on storage media in English or German. It must be hardbound, include a title page, an index and a bibliography and the pages must be numbered. The literature used as well as other resources must be indicated in full. Passages taken verbatim or almost verbatim from literature must be marked.

(4) A paper or parts thereof which the applicant has submitted within another procedure in order to earn a doctoral degree cannot be part of the dissertation.

(5) Already published work can be accepted as a dissertation by the Doctoral Committee if it was published no more than three years previously.

Section 10
Assessment of the Dissertation

(1) Immediately after the candidate's admission to the doctoral examination, the chairperson shall nominate at least two reviewers and forward the dissertation to them for assessment. If the grade of "Excellent" (summa cum laude; cf. Section 12) comes into consideration for the dissertation presented, three reviews of the dissertation are required, of which one must stem from a reviewer who is not a JMU member. In cases of doubt, the Doctoral Committee shall decide on the appointment of the reviewers. The first reviewer should be a representative of the subject area from which the topic of the dissertation is taken – as a rule, the supervisor of the dissertation. At least one of the reviewers must be a professor, at least one reviewer must be a full-time member of the Faculty of Mathematics and Computer Science, whereby the reviewers should not all belong to the same chair at the faculty. If the supervisor of a dissertation withdraws as a full-time member of the faculty, he/she may be appointed as a reviewer of the dissertation he/she has already supervised up until this point in time

up to five years after his/her withdrawal. Decisions on time extensions shall lie with the Doctoral Committee.

(1a) In the case of a dissertation by publication in accordance with Section 9 Subsection 2, the reviewers are to be chosen from the group of persons indicated in Section 4 Subsection 1 or 2. No more than one reviewer may thereby be co-author of those publications used for the dissertation.

(2) Each reviewer shall submit a written and justified review within four months, which shall include a recommendation on the acceptance or rejection of the dissertation as part of the doctoral examination and proposes a grade in accordance with Section 12 Subsection 1 to be awarded for the dissertation. A rejection equates to a "4", i.e. "Unsatisfactory".
If a reviewer considers a dissertation to be generally satisfactory but in need of improvement in some, not substantial, parts, he/she may forego proposing a grade and suggest that the applicant submits a revised version of the dissertation. Such a revision is possible only once; in the event of a repeat examination no revision is possible.

(3) If all reviewers propose that the dissertation should be revised, the chairperson shall return the dissertation to the applicant for revision. The Doctoral Committee shall otherwise decide, obtaining a further review if applicable. If the dissertation is not presented again within one year, it is deemed rejected.
If at least one of the reviewers considers the dissertation to be in need of improvement in certain parts or should an objection be raised in accordance with Section 10 Subsection 6, the Doctoral Committee may return the dissertation to the candidate for one-time revision and postpone the decision on the acceptance of the dissertation as part of the doctoral examination until it is presented again, at the latest within one year. This shall not apply in the case of a repeat examination.

(4) If the dissertation is returned to the candidate for revision, he/she also has the possibility to present a new dissertation in place of the revised dissertation; Section 10 Subsections 1 to 7 shall apply accordingly. The revised dissertation should be assessed by the same reviewers as the original one.

(5) If the reviewers' recommendation is that the dissertation should be accepted without any changes and the quality of the dissertation in terms of form and content is considerably above average and in comparison makes an exceptional scientific contribution to the subject area, reviewers may propose awarding the grade of "Excellent" (summa cum laude). The grade of "Excellent" (summa cum laude) can only be awarded if at least three reviewers propose this grade and no reviewer arrives at another, poorer grade. Upon application, the chairperson shall appoint a reviewer who must be a full-time professor at another university in accordance with Section 4 Subsection 2.

(6) The chairperson shall forward the dissertation, the list of publications, if applicable, and the reviews to all members of the Doctoral Committee by means of an electronic circulation procedure. All faculty members entitled to supervise doctorates have the right to lodge an objection with the chairperson against the reviewers' assessment of the dissertation within two weeks after the announcement of the electronic circulation procedure. The objection must be justified in writing.

(7) If an objection is raised during the circulation procedure or if the grades awarded by the reviewers differ by more than one grade on the grading scale, the Doctoral Committee shall determine the grade, obtaining a further review if applicable. This also applies if a reviewer grades the dissertation as "Unsatisfactory". If the Doctoral Committee assesses the dissertation as "Unsatisfactory", the applicant has failed the doctoral examination. Within three years of receiving notification that he/she has failed the examination, the applicant may present a new dissertation and apply again for admission. If the applicant fails to observe this deadline or if the dissertation is again graded as "Unsatisfactory", the doctoral examination is deemed as failed irrevocably.

(8) If the reviewers' recommendations with regard to the acceptance or rejection of the dissertation concur and if no objection is raised in accordance with the procedure described in Section 10 Subsection 6, the dissertation shall then be accepted or rejected according to the reviewers' recommendations. An overall grade is set for the dissertation. This is calculated to two decimal points without rounding from the arithmetic mean of all the grades proposed by the reviewers.

(9) If the reviewers' recommendations with regard to the acceptance or rejection of the dissertation do not concur or if an objection is raised in accordance with the procedure described in Subsection 6, the Doctoral Committee shall decide on the acceptance or rejection of the dissertation as part of the doctoral examination. If necessary, it may appoint further reviewers.

(10) If the grade of "4", i.e. "Unsatisfactory", is given to the dissertation on the basis of the unanimous recommendation of the reviewers or the Doctoral Committee, the doctoral examination is deemed a fail. The candidate may submit a new application for admission within two years of receiving notification that he/she has failed the examination. The candidate must present a new dissertation under consideration of the main criticisms of the first dissertation. If the candidate fails to observe this deadline or if the dissertation is again given a "4", i.e. "Unsatisfactory", the doctoral examination is deemed as failed irrevocably.

Section 11
Oral Examination

(1) If the dissertation has been accepted and graded, the chairperson shall appoint the examiners and set a time and venue for the oral examination in consultation with them. The candidate must be invited in writing at the latest one calendar week before the date of the examination, with details of the venue for the examination and of the examiners.

(2) As a rule, the oral examination shall be conducted in the form of an oral defence (*Disputation*) open to the university community. It commences with a presentation lasting about 30 minutes on the object of the dissertation by the candidate. In the subsequent discussion, members of the Examining Board pose questions to the candidate. Starting from the topic of the dissertation, the discussion extends to questions that border on the special field covered in the dissertation and should not last more than 45 minutes in total. Following this session, subject-specific questions from other members of the Faculty of Mathematics and Computer Science entitled to conduct examinations (Section 4 Subsection 1) and – at the discretion of the chairperson of the Examining Board – from other persons, who do not have to be members of the Faculty of Mathematics and Computer Science, are permitted for a period of up to ten minutes.

(3) An Examining Board shall preside over the oral defence. It shall comprise a chairperson, the first reviewer of the dissertation, who may not be the chairperson, and at least one further examiner. One member of the Examining Board should not be a JMU member; this can be one of the reviewers of the dissertation. The chairperson and the further examiner are designated by the chairperson of the Doctoral Committee. The chairperson must be a member of the Faculty of Mathematics and Computer Science of JMU. Each member of the Examining Board shall assess the oral defence and award one of the grades specified in Section 12 Subsection 1. If at least one member of the Examining Board gives the oral defence the grade of "Unsatisfactory", the oral examination is deemed a fail. An observer, who holds a doctoral degree and is versed in the subject, is designated by the chairperson of the Examining Board and shall record the main proceedings of the oral defence and the individual grades awarded; these minutes must be countersigned by the members of the Examining Board.
In the case of binational doctoral degrees, deviations regarding the number of examiners are possible in accordance with the respective cooperation agreement valid at the time.

(4) By way of derogation from Subsections 2 and 3, upon application by the candidate the oral examination may also be conducted in the form of a viva voce (*Rigorosum*) open to the university community. In this case, Subsections 6 to 10 shall apply accordingly.

(5) In individual and justified cases, the Doctoral Committee may allow, upon application, that an oral defence is conducted by electronic means via a video or sound link (video conferencing / video telephony). Prior to this decision, the Doctoral Committee must obtain the consent of all members of the Examining Board. An invigilator appointed by the Doctoral Committee must thereby ensure that the oral defence is conducted properly. There is no entitlement to completing the oral defence via video telephony. Completing the oral defence by electronic means shall only be permitted for such cases where a member of the Examining Board is absent from the place of the examination and taking part in it via video telephony and not, however, in cases where the candidate is absent from the place

of the examination.

(6)   The oral examination shall comprise two parts each lasting about 30 minutes and with different examiners. These two parts can take place immediately one after the other in the presence of both examiners.

(7)   Examiners are the first reviewer of the dissertation and a second university teacher appointed by the chairperson.

(8)   An observer, who holds a doctoral degree and is versed in the subject, shall record minutes of each part of the oral examination, which are signed by the examiner and the observer.

(9)   One part of the oral examination must cover a sub-area of mathematics or computer science. The topics of the two parts of the oral examination must belong to sub-areas that are different in terms of content. One part of the oral examination can be taken from the subject area of another faculty. This is conditional on a relevant inner relationship to mathematics or computer science. In this case, a representative of the subject from the other faculty must be appointed as examiner who is entitled to conduct examinations. Such decisions shall lie with the chairperson.

(10)   In each of the two parts of the oral examination the candidate's performance is assessed by the respective examiner and awarded a grade as specified in Section 12 Subsection 1. If the grade of "4", i.e. "Unsatisfactory", is given in at least one sub-area, the oral examination is deemed a fail.

(11)   If the candidate fails the oral examination, it must be repeated at the latest within six months. The parts of the examination failed in the first oral examination are repeated or else the oral defence as a whole. As a rule, the examinations to be repeated shall be conducted by the same examiners. If the candidate does not apply to repeat the examination or if he/she fails the oral examination again, the whole examination is deemed as failed irrevocably.

(12)   The oral examination is also deemed a fail if the candidate does not appear for the oral examination without duly justified reason or withdraws from it after it has started without duly justified reason. The reasons for withdrawal or absence must be announced to the chairperson immediately in writing and made credible. In the event of illness, the candidate must present a medical certificate. If the chairperson acknowledges the reasons, a new date is scheduled. In this case, the examination results already available are taken into account.

Section 12
Examination Grades

(1)   The following grades shall be used for the assessment of examination achievements:

1 =	Very Good (magna cum laude)	An above-average performance
2 =	Good (cum laude)	A performance that meets average requirements in every respect
3 =	Satisfactory (rite)	A performance which – apart from a few deficits – still meets the requirements
4 =	Unsatisfactory (insufficienter)	A performance that suffers from considerable deficits and is overall of no further use

Intermediate grades are not permitted. In the case of a quite outstanding performance, the grade of "1" in conjunction with "Excellent" (summa cum laude) can be awarded for the dissertation.

(2)   The grade for the dissertation is the arithmetic mean of the grades awarded by the reviewers,

expressed to one decimal place after the point, insofar as the Doctoral Committee has not set the grade for the dissertation according to the rules specified in Section 10 Subsection 7.

(3) The overall grade for the oral examination is the arithmetic mean of the marks awarded for the two parts of the examination, respectively in the case of the oral defence the arithmetic mean of the individual marks, expressed to one decimal place after the point.

(4) The overall grade for the doctoral examination is determined from the grade awarded for the dissertation and the overall grade for the oral examination. It is calculated from the sum of the grade for the dissertation counted double and the overall grade for the oral examination, divided by three and expressed to two decimal places after the point. For example, if the dissertation was awarded the distinction "Excellent" (summa cum laude), the grade of "1" is used for the calculation.

(5) The overall grade for a passed examination is based on the following averages:

Between 1.00 and 1.50	Very Good
Between 1.51 and 2.50	Good
Between 2.51 and 3.00	Satisfactory

If an overall grade of "1.00" is calculated and the dissertation has been assessed as "Excellent" (summa cum laude), the overall grade of "1" with the distinction of "Excellent" (summa cum laude) is awarded.

(6) Having completed the doctoral examination procedure, the applicant shall receive from the chairperson an examination certificate in German and English either via the Office of the Dean or by recorded delivery. This contains the grades and the names of the reviewers for the dissertation, the grades for both parts of the oral examination, respectively the individual marks for the oral defence, and the overall grade. It does not entitle the recipient to use the academic title of Doctor of Natural Sciences; this must be pointed out explicitly to the applicant.

Section 13
Publication of the Dissertation

(1) If the candidate has passed the doctoral examination, he/she is obliged to make the dissertation in its finally accepted form accessible to the scientific community in a commensurate manner through reproduction and distribution and at his/her own expense. All changes required during the doctoral examination procedure must have been implemented.

(2) The dissertation must be delivered to the Office of the Dean of the Faculty of Mathematics and Computer Science and to the University Library within one year after the date of the last examination in the form prescribed in each case as an electronic version and as three printed copies in return for an acknowledgement of receipt. The deposit copies must be printed in A5 or A4 format on ageing-resistant, wood-free and acid-free paper and permanently bound. If the candidate so wishes, he/she may deposit further printed and bound copies with the University Library for exchange purposes. In agreement with the chairperson of the Examining Board or the chairperson of the Doctoral Committee, in individual and justified cases the requirement for electronic publication may be waived if in its place seventeen (17) further printed and bound copies or fifteen (15) book trade copies for exchange purposes are deposited with the University Library. When calculating the deadline, Section 14 shall apply accordingly.

(3) In addition, the doctoral candidate is obliged to transfer to the University of Würzburg the right to produce and distribute further copies of his/her dissertation in the framework of the statutory duties of the University Library. In the case of Subsection 2 Sentence 4, the doctoral candidate is obliged to transfer the right to publish the electronic version in data networks to Würzburg University Library, the German National Library in Frankfurt am Main/Leipzig and libraries with a corresponding collection focus

(4) Before the dissertation is finally printed, regardless of whether it now appears independently or in a journal, in full or as an extract, the final print layout together with the manuscript must be presented to the supervisor of the dissertation; this shall equally apply when submitting the dissertation in electronic form. The supervisor shall confirm that the manuscript corresponds to the print layout in terms of content or that any changes have been implemented with his/her consent.

(5) At the joint request of the candidate and his/her supervisor to the University Library, after delivery of the deposit copies the library shall initially refrain from any form of publication if this type of publication stands in the way of publication in a scientific journal or the filing of a patent by the University of Würzburg. The dissertation is published as soon as the deadline for delivering the deposit copies in accordance with Subsection 2 expires. In exceptional cases, the Doctoral Committee may allow a further extension of one year. The candidate must notify the University Library of an extension granted in this way before the deadline in accordance with Subsection 2 expires; the dissertation shall otherwise be published.

(6) If the candidate fails to meet his/her obligations in accordance with to Subsections 2 to 4 within one year starting from the date of the Doctoral Colloquium, all rights attained through the examination shall expire. In exceptional cases, the Doctoral Committee may prolong the one-year deadline by a maximum period of one year. The candidate must submit a corresponding and sufficiently justified application in good time.

Part IV.
Special Rules for Doctoral Candidates with Children, a Long-Term Illness or a Long-Term or Permanent Disability

Section 14
Special Rules for Doctoral Candidates with Children, a Long-Term Illness or a Long-Term or Permanent Disability

(1)

It is possible to make use of the protection periods laid down in the act on the protection of working mothers (Maternity Protection Act (*Mutterschutzgesetz, MuSchG*)) in the respective applicable version and the periods for parental leave in accordance with the act on child-raising allowance and parental leave (Federal Child-Raising Allowance Act (*Bundeserziehungsgesetz, BerzGG*)) or in accordance with the act on parental allowance and parental leave (Federal Parental Allowance and Parental Leave Act (*Bundeselterngeld und -elternzeitgesetz, BEEG*)) in the respective applicable version. The doctoral candidate must keep the relevant records and is obliged to inform the Doctoral Committee of any changes in his/her circumstances.

(2) Anyone who is unable to complete the expected doctoral studies or examinations due to prolonged illness or due to a prolonged or permanent disability shall be entitled to complete his/her studies and examinations by a deadline set by the Doctoral Committee. The doctoral candidate must furnish the relevant evidence by presenting a medical certificate from a public health department or a public health officer. The doctoral candidate is obliged to inform the doctoral committee immediately of any changes in his/her circumstances. Deadlines are to be set in such a way that they take the restrictions caused by illness or disability into account.

(3) If the doctoral candidate shows credibly through a medical certificate from a public health department or a public health officer that he/she is unable to complete his/her doctoral studies or examinations in whole or in part in the prescribed form due to prolonged illness or a prolonged or permanent physical disability, the Doctoral Committee shall allow the doctoral candidate to complete equivalent work and examinations in another form; in cases of doubt, the chairperson shall action a decision by the Doctoral Committee. Decisions in accordance with Sentence 1 shall only be made upon written request. The doctoral candidate is obliged to inform the Doctoral Committee immediately of any changes in his/her circumstances.

(4) The nature and scale of the special provisions in accordance with Subsections 2 and 3 shall be shown accordingly on the examination certificate. Upon justified application, the Doctoral Committee may waive this requirement. Such a justified application shall apply in particular for candidates with a recognised severely handicapped pass.

Part V. Invalidity of Doctoral Achievements, Award of the Doctoral Degree

Section 15
Invalidity of Doctoral Achievements

(1) If it becomes apparent during an ongoing doctoral project or after completion of the examination procedure but before the doctoral degree certificate has been issued that the doctoral candidate is guilty of deception in the doctoral examination procedure, the Doctoral Committee may, having heard the doctoral candidate, declare all rights acquired so far to be invalid and terminate the examination procedure.

(2) If such deception should only become known after the degree certificate has been issued, the procedure shall follow the rules on the revocation of doctoral degrees (cf. Subsection 5).

(3) If the conditions for admission to doctoral studies were not met but without the doctoral candidate intending to deceive and this fact only becomes known after the degree certificate has been issued, this flaw is remedied by passing the doctoral examination.

(4) If the doctoral candidate has wrongfully obtained admission with intent, the Doctoral Committee shall decide on the required measures, taking into consideration the general principles on the reversal of unlawful administrative acts. In the event that the doctoral examination is deemed not to have been passed, the doctoral degree certificate shall be retracted.

(5) Revocation of the doctoral degree is otherwise based on the *Bayerisches Hochschulgesetz* (Bavarian Higher Education Act, BayHSchG) in the respective applicable version. The Doctoral Committee is responsible for such decisions. An external appraisal shall be obtained prior to reaching a decision on revocation. In the case of revocation of the doctoral degree, the doctoral degree certificate shall be retracted.

Section 16
Award of the Doctoral Degree, Issue of the Doctoral Degree Certificate

(1) If the doctoral candidate has met his/her obligations in accordance with Section 13 Subsections 1 to 5, the Dean shall award the doctoral degree by issuing the doctoral degree certificate.

(2) The doctoral degree certificate is issued in line with the rules of the Faculty of Mathematics and Computer Science in both German and English. It includes the title of the dissertation and the overall result of the doctoral examination. The Doctoral Committee shall decide on the form and appearance of the doctoral degree certificate. The date of the last examination is set as the date on which the doctoral examination was passed. The date on which all obligations in accordance with Section 13 Subsections 1 to 5 were met is set as the date of issue of the doctoral degree certificate. The doctoral degree certificate shall be signed by the President of the University of Würzburg and the Dean of the Faculty of Mathematics and Computer Science.

(3) From the point of time of the issue of the doctoral degree certificate onwards, the doctoral candidate may use the academic title of Doctor of Natural Sciences.

Part VI. Honorary Doctorate and Renewal of the Doctoral Degree Certificate

Section 17
Honorary Doctorate

(1) Upon justified application by at least two university teachers from the Faculty of Mathematics and Computer Science, the Faculty Board shall initiate honorary doctorate proceedings. In consultation with the Doctoral Committee, the Faculty Board shall appoint three university teachers who are members of the faculty to appraise the scientific achievements of the person to be acknowledged.

(2) The application and the appraisals shall then be made known to the members of the Faculty Board and the members of the Doctoral Committee by the Dean by way of a circulation procedure or else displayed for inspection. The start of the period of inspection must be announced. Those persons entitled to inspect the documents may comment in writing to the Dean within three calendar weeks.

(3) The members of the Doctoral Committee authorised to conduct doctoral examination procedures shall then decide on the application, under consideration of any comments submitted, if applicable.

(4) If the application is accepted, the President and the Dean shall award the honorary doctorate by presenting a certificate to the recipient in the framework of an official ceremony. The recipient's special scientific achievements are acknowledged on the certificate, which is to be signed in accordance with Section 16 Subsection 2. The date of the decision in accordance with Subsection 3 shall be inserted as the date of issue of the certificate.

(5) For the revocation of honorary doctorates, statutory provisions shall apply (cf. Section 15).

Section 18
Renewal of the Doctoral Degree Certificate

The faculty may renew doctoral degree certificates on the occasion of the 50th anniversary of the date the original was issued if this appears appropriate in view of the personage, special achievements of the person celebrating the anniversary or his/her close affiliation to the faculty. Eligible to make such proposals are the university teachers at the Faculty of Mathematics and Computer Science. Decisions shall be reached by those members of the Faculty Board authorised to conduct doctoral examination procedures.

Part VII. Transitional and Final Provisions

Section 19
Transitional Provision

(1) Doctoral examination procedures as well as any repeat examinations which commenced prior to the entry into force of the regulations presented here shall continue to be conducted in accordance with the provisions valid to date of the Regulations for the Attainment of the Degree of Doctor of Natural Sciences of the Faculty of Mathematics and Computer Science of the University of Würzburg dated 30 May 1983 in the respective version applicable to date. By way of derogation, applicants may be examined in accordance with the Doctoral Regulations presented here should they expressly wish. A corresponding declaration must be submitted in writing.

(2) Doctoral examination procedures which commenced after the entry into force of the regulations presented here shall be conducted in accordance with the provisions of these regulations.

Section 20
Entry into Force

These Doctoral Regulations shall enter into force on the day of their announcement. The Doctoral Regulations for the Faculty of Mathematics and Computer Science of the University of Würzburg dated 30 May 1983 shall expire concurrentl

Issued on the basis of the resolution of the Senate of the University of Würzburg of 24 September 2019.

Würzburg, 8 October 2019

The President:

Professor A. Forchel

The Doctoral Regulations for the Faculty of Mathematics and Computer Science of Julius-Maximilians-Universität Würzburg (JMU) were set down in writing at the University on 8 October 2019; this was announced by means of an official notice at the University on 9 October 2019. The date of the announcement is therefore 9 October 2019.

Würzburg, 9 October 2019

The President:

Professor A. Forchel