

**Examination Regulations
for the Consecutive Master's Program
Mathematics
at the Mathematisch-Naturwissenschaftliche Fakultät
of the Rheinische Friedrich-Wilhelms-Universität Bonn**

of 27 August 2012

**Including the
Changes to the Examination Regulations for the Master's Program
of 17 July 2014**

**This is a non-binding translation of the examination regulations.
For all students, the German version of the examination regulations published in the
Amtliche Bekanntmachungen of Bonn University from 27 August 2012 taking into account
the changes of the examination regulations from 17 July 2014 holds.**

Aufgrund der §§ 2 Abs. 4 und 64 Abs. 1 des Gesetzes über die Hochschulen des Landes Nordrhein-Westfalen - Hochschulgesetz (HG) - in der Fassung des Hochschulfreiheitsgesetzes (HFG) vom 31. Oktober 2006 (GV. NRW S. 474), zuletzt geändert durch Artikel 1 des Gesetzes zur Einführung einer Altersgrenze für die Verbeamtung von Hochschullehrerinnen und Hochschullehrern vom 3. Dezember 2013 (GV. NRW. S. 723), hat die Mathematisch-Naturwissenschaftliche Fakultät der Rheinischen Friedrich-Wilhelms-Universität Bonn die folgende Prüfungsordnung erlassen:

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Comment as to use of language:

All employment titles in these regulations hold for women and men in the same way.

§ 1 Goal of Studies and Purpose of Examination

(1) The Master's Course in Mathematics is offered by the Faculty of Mathematics and Natural Sciences of the Rheinische Friedrich-Wilhelms-Universität Bonn. It is intended as a consecutive course of study and is research-oriented.

(2) The Master's Examination culminates in the awarding of a further job-qualifying degree. The course offers deepened and research-oriented instruction in the field of study Mathematics.

(3) The students are to learn how to approach complex problems and solve them using scientific methods also beyond the prevailing state of knowledge.

(4) Studies in this Master's course are to give students the necessary knowledge, skills and methods to pursue independent academic work, to view, criticize, and assess developments in their field, and to be responsible persons and scientists. The goals of these studies are foremost to give the students the following:

- a) Greater understanding of current problems in the field on the basis of increased basic knowledge,
- b) methodical and analytical competencies in order to independently increase scientific knowledge. Research strategies will be of central importance.

(5) A study plan will be established in order to facilitate a proper course of study.

(6) The language of instruction is English. In exceptional cases, course offerings in the area "Elective Course Offering – Foundation Modules" may be given in the German language. The Master of Science Degree can be obtained without participating in course offerings held in the German language, with a decreased number of choices. For more on this matter see the Plan of Modules.

§ 2 Academic Degree

Upon passing the Master's Examination, the Faculty of Mathematics and Natural Sciences of the Rheinische Friedrich-Wilhelms-Universität Bonn shall award the academic degree "Master of Science (M. Sc.)" in the subject area Mathematics.

§ 3 Acceptance Requirements

(1) The study programme in Mathematics is intended for applicants who fulfill the following acceptance requirements:

1. A first job-qualifying university degree in the subject Mathematics, or in a related field, with a grade point average comparable to at least the equivalent of 2.5 in Germany. The examination board decides on a case by case basis which subjects or courses of study are to be considered related. Beyond this, at least 120 credit points from mathematical modules are to be proven.
2. Sufficient mastery of the English language by way of completion of a TOEFL exam (Test of English as a Foreign Language) with 550 points, a computer-automated TOEFL exam with 213 points, an internet TOEFL exam with 79, an IELTS exam (International English Language Testing System) with 6.0 points, or an equivalent proof.

3. In the case of applicants who are neither Germans nor citizens of a member state of the European Union, the passing of an examination demonstrating the applicant's abilities for the study programme (appendix 1, *not included*)

(2) Capacity related acceptance restrictions (Numerus clausus) remain untouched.

§ 4 Regular Duration of Study, Structure of Studies and Range of Study Courses

(1) The regular duration of study is 4 semesters including the Master's Thesis.

(2) The contents of study are thus selected and limited that graduation can take place within the standard period of study. The study contents are presented in the form of modules, which generally consist of thematically, methodically, or systematically related single-semester courses. Modules which are stretched over two consecutive semesters are also allowed.

(3) Each module is generally completed with a module examination and is valued with credit points (CP) according to the ECTS (European Credit Transfer and Accumulation System). One ECTS-CP represents a calculated student workload of 25 to maximally 30 hours in terms of lecture and study time.

(4) The Master's Course consists of modules all-together valued at 120 CP. From these, 36 CP are obtained as part of the obligatory modules, namely the Master's Thesis (30 CP) and the accompanying Master's Thesis Seminar (6 CP). Optional modules make up 84 CP. The optional foundation and lecture course modules are divided in appendix 2 (*not included*) into the six mathematical areas:

- A (Algebra, Number Theory and Logic)
- B (Analysis and Differential Equations)
- C (Discrete Mathematics)
- D (Geometry and Topology)
- E (Numerical Mathematics and Scientific Computing)
- F (Stochastics)

Among the optional modules, 48 CP must be accumulated in lecture course modules of the areas A, B, C, D, E, F from appendix 2. In addition, in 3 of the 6 areas A, B, C, D, E, F, at least 23 CP, 16 CP, and 9 CP must be accumulated. Further, 12 CP must be accumulated from the graduate seminar modules listed in appendix 2. The other at most 24 CP can be accumulated in any modules from appendix 2 and in modules of a secondary subject according to Section 5. Up to 6 CP may be accumulated in other Master's courses of the University of Bonn, in so far as they do not significantly overlap with the modules in appendix 2. The examination board decides the acceptability of the modules.

The particulars of the modules, their prerequisites and their number of credit points can be found in appendix 2.

(5) A student can choose a secondary subject. Permitted secondary subjects are Physics, Computer Science and Economics. All relevant modules of the above mentioned Master's courses are permitted secondary subject area modules, in so far as the examination board does not decide otherwise. Other Master's courses offered at Bonn University can be approved as a secondary subject area by the examination board, on request of the student. In this case it will simultaneously be decided which modules the student may complete. The choice of a secondary subject is effective when registering for the first module examination of the subject, or, in the case of phrase 4, through the approval decision. A change of the secondary subject is not possible. However, the choice of a secondary subject does not require the accumulation of a certain number of credit points. The module

examinations of the designated Master's course chosen as a secondary subject are processed according to the examination rules of the respective study programme.

(6) The studies can begin in the winter or the summer semester. A start in the winter semester is recommended.

§ 5 Access to Particular Course Offerings

(1) In the case that for a particular course offering a limited number of participants is allowable due to the kind or purpose of the course or due to any other reason of research or teaching, and should the number of interested students exceed this limit, then the dean of the relevant faculty decides, on behalf of the lecturer and according to Section 59 HG ("Hochschulgesetz"), about the list of participants.

(2) Course offerings whose number of participants is limited will be determined in the Plan of Modules. The Faculty Board announces the number of participants at the beginning of the semester. The criteria of priority are fixed in appendix 3 of these examination regulations.

§ 6 Examination Board

(1) For the organization of the examinations as well as the completion of tasks mentioned in the examination regulations, the Faculty Board of the Faculty of Mathematics and Natural Sciences forms a common examination board for the Bachelor and Master's courses of study in the subject Mathematics. The dean of the faculty shall insure that the examination board properly fulfills and is able to fulfill its tasks. The dean gives the necessary directions and shall seek to provide the necessary administrative support.

(2) The examination board is composed of a chairman, the vice-chairman and seven other members. The chairman, vice-chairman and four other members shall be elected from faculty. One further member shall be elected from the scientific staff, and one member each from among the students of the Bachelor's programme and the Master's programme in Mathematics, by groups separate, by the Faculty Board.

(3) Eligible to the examination board are faculty members, who are engaged partly in teaching at the Bachelor or Master's study programmes, or who in the course of the academic year actually teach at least 2 semester hours per week (SWS). Members of the scientific staff are eligible if they are assigned to the Bachelor or Master's programme. Students are eligible if they are matriculated in the Bachelor's or Master's programme. For each member a substitute shall be chosen. The mandate for members from the group of the faculty and from the scientific staff is three years, from the groups of the students one year. Re-election is allowed.

The position of faculty dean and of vice-dean is compatible with membership in the examination board as well as with the chairmanship and vice-chairmanship, in so far as the faculty regulations allow this.

(4) The examination board has the status of an authority in terms of the administrative procedure laws.

(5) The examination board insures that the examination regulations are observed and it insures that the examinations are properly completed. It is in particular responsible for the ruling on objections against decisions taken in examination procedures.

(6) The examination board reports regularly, at least once a year, to the Faculty Board on the development of the examination and study periods, including the time length of the Bachelor and

Master's theses, and as well as on the distribution of the final grades. The board gives recommendations for the reform of the examination regulations and of the plan of studies. The board can rule to delegate completion of tasks to the chairman. Delegating decisions about objections as well as the reports to the Faculty Board is excluded.

(7) The meetings of the examination board are to take place under closed session. The members of the examination board and their substitutes are under obligation of discretion. In so far as they are not civil servants, the chairperson of the examination board is to commit them to discretion. Minutes of the meetings shall be written, containing results of the debates and the decisions of the examination board.

(8) A decision of the examination board may be cast, if next to the chairperson or the vice-chairperson at least two other university faculty members or their substitutes are present. Decisions are made by a majority ruling. In case of a tied vote, the vote of the chairperson decides the ruling. The student representatives in the examination board do not have a vote in regards to measures concerning valuation and recognition of study periods or examinations, the making of examination questions, or the assignment of examiners and assessors. The non-student representatives in the examination board have the right to view and/or sit in on the examinations. § 15 Par. 4 remains in force.

(9) Arrangements, the setting of dates and other communications of the examination board, which do not concern only individual persons, will be made public either in written or electronic form, under proper and legal adherence to data protection laws. Other announcements are allowed, but not legally binding.

§ 7 Examiners and Assessors

(1) The examination board assigns the examiners and the assessors for the individual examinations. Only the teachers at the University of Bonn and persons with relevant professional experience and vocational training, in so far as this is necessary for the purpose of the examination, are entitled to administer examinations. Examinations may only be evaluated by persons who themselves have obtained at least the same or an equivalent qualification. A person may act as assessor only if that person has obtained the subject-specific master degree or an equivalent qualification. The "Diplom" degree is considered equivalent to a Master's degree in the sense of this paragraph.

(2) Module examinations are to be held by the university teacher responsible for the module. In case that the lecturer is precluded from holding the examination in due time because of sickness or other important reasons, the examination board appoints a surrogate examiner for the module examination. The surrogate examiner should already have independently offered study courses of the module in question.

(3) The examiners are independent from outside directives regarding their examination functions. The examiners and the assessors are under the obligation of discretion. In so far as they are not civil servants, the chairperson of the examination board is to commit them to discretion.

(4) The examinee can propose the examiners for the Master's Thesis. The proposal should be considered if possible, however, it does not constitute a claim.

(5) The examination board ensures that the examinee is notified of the names of the examiners in time, namely, at least two weeks before the time of the examination.

§ 8 Recognition of Study Achievements and Transfer of Credit

(1) Academic results achieved in a study programme at another university falling under jurisdiction of the German Constitution will be officially recognized in the same study programme without ascertaining their equivalence.

(2) Academic results achieved in other study programmes, or at another university or a state job academy or a job academy recognized by the state, falling under jurisdiction of the German Constitution, are to be recognized on the basis of equivalence of content; upon request this also holds for study achievements from universities falling outside of the jurisdiction of the German Constitution. When deciding about the equivalence the agreements made by the Conference of the Ministers of Education and Cultural Affairs (“Kultusministerkonferenz”) and by the German Rectors' Conference (“Hochschulrektorenkonferenz”), as well as agreements made in the framework of university partnerships, shall be observed. Equivalence is to be stated if study and examination results do not differ substantially from the results required in these regulations regarding contents and quality requirements. Here holistic judgment and evaluation is called for rather than schematic comparison. A difference only of the allocated number of credit points is not considered a substantial difference. The above regulations hold for achievements from study programmes of advanced education, respectively. If there are no substantial differences the achievements will be fully recognized. If an assessment according to the principles named in this paragraph has the result that an achievement can only partially be recognized then it shall be partially recognized in the framework of the respective module. The module will only be passed when all its requirements according to these examination regulations have been fulfilled; the credit points are awarded upon successful completion of the module.

(3) Upon request, other knowledge areas and qualifications based on presentable documents can also be transferred into this course of study.

(4) The Academic Degree “Master of Science” will be awarded by the Faculty only when both the 30 CP for the Master's Thesis and the 6 CP for the Master's Thesis seminar and at least further 24 CP according to § 4 Par. 4 have been obtained at the University of Bonn.

(5) The examination board is responsible for the transfer of credit according to Par. 1 through 3. Before conclusions are drawn concerning the equivalence of courses, responsible department representatives are to be consulted. Further, if doubts arise concerning the equivalence of courses done abroad, the “Zentralstelle für ausländisches Bildungswesen” (Central Bureau for Foreign Education Systems) can be consulted. The student has to be informed about the decision regarding the recognition or denial thereof within eight weeks, together with an instruction on the right to appeal. In case that studies can not or only partially be recognized, the examination board has to indicate the reasons; it carries the burden of proof.

(6) If study achievements are recognized, the grades – in so far as the gradings are comparable – shall be transferred and shall contribute to the calculation of the total grade, weighted according to the number of CP corresponding to the module for which the achievements are recognized. If study requirements for examinations are recognized, they are to be transferred without grade and marked “passed”. The mark “passed” is also to be given if the grading systems are not comparable. The recognition is to be denoted in the final certificate. Study achievements from courses of study without a credit point system are to be allocated credit points by the examination board, in so far as the examination is considered equal to a certain module of these examination regulations. Here the guidelines set down by the Conference of the Ministers of Education and Cultural Affairs (“Kultusministerkonferenz”) for the comparison with the ECTS system are to be followed. Hence modules are to be recognized if there are no significant differences with regard to the acquired competency.

(7) If the requirements of Par. 1 to 2 are satisfied there is a legal entitlement to recognition. The students are to submit the necessary documents for the recognition and share the corresponding information. The examination board can demand a declaration from the student that all study achievements which can be recognized have been named. The transfer of credit and the admission to further examinations can be denied so long as the student does not fulfill his/her obligation to cooperate.

§ 9 Range of the Master's Examination and Examination Dates

(1) The Master's examination shall demonstrate a further job-specific, deepened and research-oriented scientific qualification in the subject area Mathematics.

(2) The Master's examination is composed of

- The module examinations accompanying the studies, corresponding to the content of teaching of the modules specified in appendix 2, and
- The Master's thesis.

All of the examination results should be obtained within the standard study period as defined in § 4 Par. 1.

(3) The necessary examination results are to be obtained during the course of study. Each module, even when it is made up of several parts, is as a rule completed by way of a module examination, the result of which is entered into the final certificate. The awarding of the credit points presupposes the successful completion of the corresponding module. A module is considered successfully completed when the corresponding module examination or all the corresponding partial examinations are graded with at least the mark "ausreichend" (4.0).

(4) If a module is made up of several parts, and each part is completed by a partial examination, then the credit points will be awarded upon completion of the last partial examination.

(5) The examinations will generally be held in the language of instruction. The examinations or parts of the examinations can upon request of the student and upon agreement with the examiner or examiners also be held in the German language. There is, however, no legal right that the examination or part of the examination can be held in the desired language.

§ 10 Registration and Admission, Deadlines

(1) The request for admission to the Master examination in the study programme Mathematics is to be directed in written form to the examination board, together with the registration for the first module examination. The following documents need to be attached:

- a) Proof of the general access requirements designated in § 3;
- b) Proof of matriculation as ordinary student in this course of study at the University of Bonn, or of matriculation as ordinary student in some course of study at the University of Bonn which according to its own examination regulations imports modules of this course of study, or proof of acceptance as visiting student according to § 52 HG;
- c) Declaration whether the examinee has not passed or definitively has not passed an examination or the Master's examination in this course of study or in a related or comparable course of study, or whether the examinee is simultaneously engaged in an examination process of such a course of study;
- d) Proof whether and which module examinations or comparable study achievements or examination results have been already completed at another university;
- e) A curriculum vitae of the examinee containing a photo of the examinee.

- (2) A student can only be admitted to the module examinations if he/she
- satisfies and proves the access requirements according to Par. 1 letter a) through d);
 - satisfies possibly further special access requirements for the module and the module examination, including the limitations on the number of examinees.
- (3) Each module examination requires a specific electronic registration with the examination board. The registration in written form remains possible in well-grounded cases. The registration can in any case only happen so long as the access requirements are satisfied. The examination and registration dates are made public by the examination board by notice or electronically; they are meant as terms of exclusion. Without giving reasons, the students can deregister from the module examination up to one week before the examination date, in written or electronic form. The date of reception by the examination board is significant. Deregistration is not possible for modules whose examinations are spread out throughout the semester and are connected with a study course (seminars and practical training courses) after the assignment of the topics or places.
- (4) When registering for the Master's Thesis the examinee needs to provide proof of the successful completion of the necessary modules (according to the Plan of Modules in appendix 2), and to declare in which of the subject areas A, B, C, D, E, or F, and with which advisors he/she would like to complete the Master's Thesis.
- (5) If the examinee can not supply one of the documents listed in Par. 1 in the prescribed way, then the examination board can allow him/her to prove the required item by other means than by submission of the document.
- (6) The examination board decides about the admission.
- (7) The admission may only be denied if
- the documents required according to Par. 1 are incomplete and/or are not submitted although having been demanded,
 - the requirements of Par. 2 are not satisfied,
 - the student has finally failed at an examination or at the Master's degree in this study programme or in a related or comparable study programme, or
 - the student is at the same time in another examination process in this study programme or in a related or comparable study programme.

§ 11 Procedures of the Study-Related Examinations

- (1) Module examinations refer to the contents of the modules specified in appendix 2.
- (2) During the module examinations the student needs to be enrolled as an ordinary student or accepted as auditor according to § 52 HG in this study programme at the University of Bonn, or in another study programme of the University of Bonn which imports modules of this study programme according to its own examination regulations.
- (3) In the module examinations it will be verified that the examinee has obtained the theoretical knowledge of the subject areas taught and the ability to understand overarching connections. Module examinations can be completed by way of assessed partial examinations. The module examinations and partial examinations can take the form of a written or oral examination, a project, a presentation or a seminar talk. The particular examination form and the admission requirements will be set down in the Plan of Modules (appendix 2). Deviation from the guidelines established in the Plan of Modules are possible according to § 14 Par. 5 and § 15 Par. 5. The concrete examination form is then to be established by the examination board in coordination with the examiners, and to be announced in due time at the beginning of the semester according to § 6 Par. 9.

(4) The Plan of Modules can determine that prerequisites (study results) are necessary for participation in a module examination. If these are not effected admission to the module examination can not be granted. The concrete requirements for the prerequisites (study results) are made public by the examination board upon request of the lecturer at the beginning of the semester according to § 6 Par. 9.

(5) For all module examinations which take place in the form of a written or oral examination, two examination dates are set in the semester in which the module is completed. Usually the first examination date takes place shortly before or after the lecture period of the particular semester. The second examination date usually takes place at the end of the semester. The form of examination can differ between the first and second examination (see § 14 Par. 4 and § 15 Par. 5). The registration for a module examination always holds for the first examination date. In case that the examinee does not pass the first examination he/she will automatically be registered for the second examination. Deregistration is in this case not possible. If none of the two examinations yields the achievements necessary for passing the examination, then the module is considered not passed.

(6) In course offerings (with the exception of lectures) in which the qualification goal can not be reached in another way, upon request of the lecturer or the person in charge of the module, the examination board may establish the regular, active, or successful participation as prerequisite for participation in the module examination. In this case it is to be defined what a regular, active, or successful participation means. The decision is to be announced according to § 6 Par. 9 by the examination board.

Because the understanding of mathematical contents can only be reached optimally through the common learning and active solving of problems in exchange with other students and the lecturer, the successful participation in the problem sessions will be an acceptance requirement for written or oral module examinations in all modules to which problem sessions are subordinated.

(7) If the examinee shows credibly to the examination board that, due to disability which is constant or lasts more than one semester, or due to a chronic sickness, he/she cannot technically realize his/her existing intellectual abilities and take the examination in full or partial form, then the examination board can allow that the examinee provides equal study and/or examination results in a suitable way, possibly also within a longer time frame.

§ 12 Repetition of Examinations

(1) Every module examination or partial module examination, which is not passed or is considered not passed, may be repeated at most once. Failed examinations in an equal or related or comparable course of study from universities in jurisdiction of the German Constitution will be recognized. The examination board decides which courses of study will be regarded as equal. The two-time failure to pass the examination of an obligatory module results in the loss of the right of examination and leads to exmatriculation from this course of study.

(2) A module examination which is passed, that is, graded with at least "ausreichend" (4.0), can not be repeated.

(3) A failed module examination of a seminar or an internship can, because of the particular character of the examination, only be repeated by repeating the module.

(4) Rules for secondary subject modules are subordinate to the module regulations of the respective secondary subject. Insofar, par. 1 through 4 will not be applied to secondary subject modules.

§ 13 Protective Regulations, Absence, Reprimands, Withdrawal, Cheating, Breach of Regulations

(1) An examination will be graded “nicht ausreichend” (5.0), if the examinee is not present at the examination without proper excuse, if he/she leaves the examination without proper excuse after it has started, or if the examinee does not turn in the Master's Thesis on time. The same holds, if a written examination is not finished within the allotted time. Up to a week before the particular examination date the examinee may deregister from the examination either in written form or electronically. The date of reception by the examination board is significant.

(2) The reasons for either withdrawal or absence at an examination must be explained to the examination board immediately in written form, and they must be believable. In case of an examinee's sickness, a medical certificate may be demanded which contains the diagnosis in so far as the examination board needs to know that attempting the examination was not possible. In individual cases the examination board may demand a medical certificate from a (public) health officer. If the examination board recognizes the examinee's reasons, then the examination attempt is considered as not taken. Deficiencies of an examination must be immediately brought to the attention of the examiner or supervisor by the examinee. The complaint must be recorded and asserted before the examination board. Phrase 4 holds in this case.

(3) Should it be attempted to influence the result of an examination through cheating or the usage of non-permitted material, then the examination result shall be awarded the mark “nicht ausreichend” (5.0); the conclusion will be made by the examiner or supervisor, taken on record and sent to the examination board. An examinee who disrupts the orderly taking of the examination may be removed from the sitting of the examination by the examiner or supervisor; in this case the examination is awarded the mark “nicht ausreichend” (5.0). The reasons for the exclusion are to be taken on record.

(4) Within a timespan of two weeks examinees can demand that decisions according to Par. 3 S. 1 and 2 are re-evaluated by the examination board.

(5) Upon request of the examinee, the maternity protection periods are to be heeded, as they are delineated in the current maternity protection law (Mutterschutzgesetz, MuSchG). The necessary documentation of proof is to be included with the request. The maternity protection periods interrupt deadlines according to these examination regulations; the timespan of the maternity protection will not be counted towards the deadlines.

(6) Similarly, upon request the periods of the parental leave are to be heeded according to the current law concerning parental compensation and parental leave (BEEG). Examinees must inform the examination board at least four weeks before the intended beginning of the parental leave about the desired time period or time periods of their parental leave, simultaneously providing the necessary documents. The examination board has to check whether the lawful preconditions are fulfilled which would entitle an employee to claim his/her right on parental leave according to the BEEG; the examination board then informs the examinee about the result and possibly about the new established examination deadlines without delay. The working period for the Master's Thesis cannot be interrupted by the taking of parental leave. The original thesis topic is considered as not assigned. After the ending of the parental leave the examinee receives a new topic.

(7) A leave of absence on grounds of caring or support for spouses, civil marriage partners, direct lineage family members or first degree relatives by marriage are possible upon request if these persons are in need of care. The examination board rules whether the conditions of phrase 1 are given. The request is to be handed in immediately after the beginning of these conditions. Substantial proof should be turned in with the request. The examination board informs the examinee about the result and possibly about the new established examination deadlines without delay. The working period for the Master's Thesis can not be extended due to such a leave of absence. The original

thesis topic is considered as not assigned. After the ending of the leave the examinee receives a new topic.

(8) In case of a repeated or otherwise serious attempt at cheating the examinee may be exmatriculated. The examination board decides rulings on such matters.

(9) Whoever intendedly violates a rule of these examination regulations concerning the attempt to cheat conducts a regulatory offence. The regulatory offence can be fined up to a sum of 50,000 Euros. The responsible authority for the prosecution in such cases is the Chancellor of the University of Bonn.

§ 14 Written Examinations

(1) In the written examinations the students are to prove that they are able to recognize ways to solve a problem from the learning contents of the module with the current methods in the areas and to apply these ways towards a solution of the problem in a limited time span and with limited auxiliary means. The examiners announce well in advance which auxiliary means are allowed.

(2) Written examinations can take the form of hand-written work under supervision or multimedia-based forms. Multimedia-based examinations consist in particular of free text problems or cloze problems.

(3) Every written examination lasts at least 30 minutes and at most 180 minutes, and it is to be graded by an assigned examiner. An examination by which the course of study is completed or a repeated examination which does not have any means of compensation in case it is not passed, shall be graded by two examiners. The total grade for the examination is then given as the arithmetic mean of the individual grades. The concrete date will be announced at the beginning of the semester by the examination board.

(4) Upon request the examinee has to be given the opportunity to view his graded written work; the request must be made at most three months after the announcement of the examination grade. The examination board informs the examinee about the period of time for the viewing in due time. § 29 of the Administrative Procedures Law of the "Land" Nordrhein-Westphalia (VwVfG-NRW) remains in effect.

(5) The examination board may, in agreement with the examiner, replace a written examination by an oral examination covering the contents of the module. This will be announced in due time at the beginning of the semester, in accordance with § 6 Par. 9.

§ 15 Oral Examinations

(1) In oral examinations the examinee shall show that he possesses a broad spectrum of knowledge in the examination area, including its interrelations, and that he is able to place special considerations within these interrelations and to point out approaches for solutions.

(2) Oral examinations are held either by several examiners (collegiate examination) or by a single examiner in the presence of a knowledgeable assessor as a single or a group oral examination. Deviation from the standard procedure is possible if the traceability of the examination is ascertained. An examination by which the course of study is completed or a repeated examination which does not have any means of compensation in case it is not passed, shall be graded by two examiners. The total grade for the examination is then given as the arithmetic mean of the individual grades. If the examination is held by several examiners, then in each knowledge area the examinee shall be tested by one examiner only. In case that the examination takes place in the presence of an assessor then

the examiner shall consult the assessor before the settling of the final grade, in the absence of the student. For each examinee and module examination, the examination shall last between 15 and 45 minutes. In the case of group examinations it is to be assured that each examinee within the group receives the same examination time.

(3) The essential contents of the examination and the grade for each examination are to be officially recorded. The examinee is to be informed about the result subsequent to the examination.

(4) Students who intend to sit a later examination date of the same oral examination may audit an oral examination if there is enough room and if no examinee objects. The examiner decides a ruling, or the chairperson in case of a commission. The right to audit does not extend to the deliberation and announcement of the examination grade. The auditors are not allowed to take notes during an examination.

(5) The examination board may, in agreement with the examiner, replace an oral examination by a written examination covering the contents of the module. This will be announced in due time at the beginning of the semester, in accordance with § 6 Par. 9.

§ 16 Projects, Presentations and Seminar Talks

(1) Projects usually serve to show the ability to work as a team and in particular to develop, implement and present concepts. The examinee should demonstrate that he can define goals and work out interdisciplinary approaches to solutions and concepts within a larger task. In the case of a team project, the individual contribution of each of the examinees must be evident, it must be evaluated separately and it must satisfy the requirements of phrase 1. For the presentation of projects § 15 Par. 2 and 3 hold. The length of the presentation should be at least 10 minutes and at most 60 minutes for each examinee. Projects should be completed up to the end of the semester in which the course takes place.

(2) Presentations are oral talks lasting between 10 and 60 minutes. They document the ability to present one's own results which were achieved by scientific methods in a verifiable way and to clarify points of discussion. Presentations must be held up to the end of the semester in which the course takes place. Further, § 15 Par. 2 and 3 hold.

(3) Seminar talks are oral talks with discussion and last between 30 and 90 minutes. The talks are based on original scientific literature and one's own research. They document the ability to present scientific results in a verifiable way and to clarify points of discussion. The examinee will be informed about his evaluation directly after the oral examination. Seminar talks must be held up to the end of the semester in which the seminar takes place. Further, § 15 Par. 2 and 3 hold.

§ 17 Master's Thesis

(1) The Master's Thesis is a written form of examination, intended to demonstrate the examinee's ability to process a problem from the area of the course of study independently according to scientific methods, to come to a solution and to represent the solution in a suitable way, within a given time frame. Upon registration for the Master's Thesis the examinee shall be given the opportunity to make suggestions as to the area from which the thesis' topic is chosen; however, the examination board is not bound to these suggestions.

(2) The topic of the Master's Thesis can be set by any assigned examiner according to § 7 Par. 1. Whoever sets the topic of the Master's Thesis usually also acts as the advisor. If the Master's Thesis shall be set and advised by another lecturer who is active in research and teaching at the university or from another institution outside of the university, then the examination board must agree, which is only

possible if it is ascertained that the Master's Thesis is also suitably advised by an examiner found in accordance with § 7 Par 1.

(3) Upon request of the examinee, the examination board will assure that the examinee receives a topic for the Master's Thesis in due time.

(4) The topic of the Master's Thesis can only be set when the examinee has earned at least 30 CP. The Plan of Modules may require further prerequisites, e.g. the passing of certain modules. The Master's Thesis topic is assigned through the examination board. The topic and the date of the assignment will be officially recorded. The topic of the Master's Thesis will usually be set at the end of the second semester.

(5) The Master's Thesis can be assigned in the form of a group thesis, if the contribution of each of the individual examinees is made evident in terms of sections, numbers of pages, or other objective criteria which make a clear separation possible, and if the requirements of Par. 1 are satisfied. The text portion of the Master's Thesis shall comprise at least 10 and at most 100 DIN-A4-pages; in the case of group works the individual contribution of each of the examinees comprises at least 10 and at most 100 DIN-A4-pages.

(6) The Master's Thesis has a workload value of 30 CP. The working time is at most 12 months. The topic, goals and range of the Master's Thesis are to be limited in such a way that the Master's Thesis may be completed under reasonable demand within the given time frame. Upon justified request, the examination board may, with agreement of the advisor, extend the working time by up to six weeks. The examinee can revoke the topic of the Master's Thesis only once and only within the first two months after the date of assignment. A revocation under these conditions is not considered as a failed attempt.

(7) When turning in the Master's Thesis the examinee must state in written form that he/she has independently completed the thesis, or his/her contribution to the thesis in the case of a group thesis, using only the cited sources and materials and having marked all quotations. A Master's Thesis has in particular not been independently completed if the contents or the structure of the deliberations has been provided by a third party. The examination board can require an affirmation in lieu of an oath and a digital copy of the Master's Thesis for an electronic comparison from the examinee.

§ 18 Acceptance, Evaluation and Repeating of the Master's Thesis

(1) The Master's Thesis is to be submitted to the examination board in three copies within the deadline; the time of reception is to be officially recorded. Once turned in the Master's Thesis may not be recalled. If the Master's Thesis is not submitted in time, it will be awarded the mark "nicht ausreichend" (5.0).

(2) The Master's Thesis is to be evaluated and graded by two examiners assigned according to § 7 Par. 1. One of the examiners is the advisor who set the thesis' topic; the examination board chooses the second examiner among the examiners according to § 7 Par. 1. It must be ensured that at least one of the examiners is a member of the group of university teachers (professors) at the University of Bonn. The examinee has the right to suggest an examiner, but there is no claim that a certain examiner will be assigned.

(3) The individual evaluation is to be carried out according to § 19 Par. 1 and to be justified in written form. The grade of the Master's Thesis will be set as the arithmetic mean of the individual grades, in so far as the difference is less than 2.0. If the difference is greater than or equal to 2.0, the examination board assigns a third examiner to evaluate the Master's Thesis. In this case the final grade is given as the arithmetic mean of the two better individual grades. The calculation of the

average will be carried out according to § 19 Par. 6. The Master's Thesis can only be graded "ausreichend" or better if at least two grades are "ausreichend" or better.

(4) If the Master's Thesis was completed by several students as a group thesis then the individual contribution of each of the students is to be evaluated individually.

(5) The examinee earns 30 CP for the Master's Thesis graded "ausreichend" (4.0) or better.

(6) If the Master's Thesis is not passed or if it is considered not passed, then the examinee can repeat it once. Failed attempts in the same subject area at another university in jurisdiction of the German Constitution are recognized. The topic of the second Master's Thesis does not necessarily have to be taken from the same subject area as that of the first Master's Thesis. A revocation of the topic of the Master's Thesis according to § 17 Par 6. phrase 5 is only allowed if the student has not already used this opportunity with the first Master's Thesis attempt. If the second Master's Thesis is also given the mark "nicht ausreichend," the Master's Thesis is finally failed. This results in the loss of the right of examination and leads to exmatriculation from the Master's course of study Mathematics.

§ 19 Evaluation of the Examinations, Determination of Grades and Passing the Master's Examination

(1) The grades for individual examinations will be fixed by the respective examiners. In the case of several examiners the final grade is determined as the arithmetic mean of the individual grades given by each examiner. The following marks are to be used:

1	sehr gut	an excellent performance
2	gut	a performance considerably better than satisfying the average requirements
3	befriedigend	a performance which satisfies the average requirements
4	ausreichend	a performance which despite its deficiencies satisfies the requirements
5	nicht ausreichend	a performance which on account of considerable deficiencies does not satisfy the requirements

For a differentiated evaluation of the examinations the individual marks can be increased or decreased by 0.3; the marks 0.7, 4.3, 4.7 and 5.3 are excluded.

(2) The examination in a module is considered passed if the module grade is "ausreichend" (4.0) or better. If the module grade is composed of several partial examinations then it will be given as the weighted arithmetic mean of the grades of the individual examinations. The weights are given in appendix 2.

(3) The evaluation of written examinations are to be announced to the examinee within four, the evaluation of the Master's Thesis within eight weeks after the completion of the examination. The results can be announced either on a notice board or electronically in the examinations' administration data base, according to the data protection guidelines. *The announcement should be made before the end of the regular study period.*

(4) The Master's Examination is passed when all module examinations and the Master's Thesis have been passed with a grade of "ausreichend" (4.0) or better, 120 CP have been obtained and the conditions mentioned in §§ 4 Par. 4 and 8 Par. 4 have been satisfied.

(5) The final mark of the Master's examination is calculated as the arithmetic mean of the individual module grades weighted with the CP of the respective module. The module grade given in the final certificate reads as follows:

with an average up to and including 1,5	= sehr gut
with an average from 1,6 up to and including 2,5	= gut
with an average from 2,6 up to and including 3,5	= befriedigend
with an average from 3,6 up to and including 4,0	= ausreichend
with an average from 4,1	= nicht ausreichend.

In deviation, a final mark of "ausgezeichnet" is awarded if the average grade is "sehr gut" (1.1) or better and if the Master's Thesis was awarded with "sehr gut" (1.0). Modules which have been recognized as "bestanden" due to incommensurability do not count towards the calculation of the final mark.

(6) In the calculation of the module grades and of the final mark only the first decimal places will be considered; all further decimal places will be discounted without rounding.

(7) In order to facilitate the international comparability, the final mark should be ranked according to the European Credit Transfer and Accumulation System (ECTS).

(8) The Master's Examination is finally failed if

- the accompanying seminar to the Master's Thesis is failed twice according to § 12 Par. 1, or
- the repeated Master's Thesis is graded with "nicht ausreichend" (5.0) according to § 18 Par. 6.

§ 20 Final Certificate

(1) Upon the results of successful completion of the Master's Examination and final submission of all grades, the examinee will be awarded a temporary certificate of completion of the Master's Examination. After this a final certificate will be issued in German and, in addition, an English translation authorized by the examination board will be included. The final certificate includes the following:

- all modules from which credit points were earned,
- the semester during which the credit points were earned,
- the grades of the individual examinations,
- the title and the grade of the Master's Thesis,
- the date of the last examination, and
- the final mark of the Master's Examination and the relevant ECTS mark.

(2) Upon request of the examinee the grades and the credit points of the examinations done in other subject areas or in other modules according to § 25 will also be included in the final certificate. The final certificate shall adhere to the standards of international comparison as given by ECTS.

(3) The Master's Diploma bears the date of issue. It is imprinted with the seal of the examination board and signed by the chairperson of the examination board.

(4) In case the Master's Examination is or is considered finally failed, the examination board notifies the examinee about this in writing, with an instruction on the right to appeal.

(5) Should a student leave the university without completion of studies, then he/she can receive upon request a transcript of records containing all completed study and examination results. The transcript is restricted to the successfully completed parts of the course of study. Further, upon request of the student, a document can be produced listing which examinations have not been passed or which are still missing for the passing of the Master's Examination.

§ 21 Diploma Supplement

To the final certificate a diploma supplement will be added. The diploma supplement provides in a standardized English version complementary information on the academic contents, the academic process, the academic and career qualifications based on the earning of the degree, and information on the conferring university.

§ 22 Master's Diploma

At the same time the examinee will receive the final certificate and also a Master's Diploma signifying the bestowal of the academic degree according to § 2, written in the German language and with the same date of issue as the final certificate. Upon request of the examinee an English translation of the Master's Diploma can also be provided. The diploma will be signed by the dean of the Faculty of Mathematics and Natural Sciences and by the chairperson of the examination board, and will be imprinted with the seal of the Faculty of Mathematics and Natural Sciences.

§ 23 Inspection of the Examination Records

(1) Within a time period of six months after bestowal of the final certificate the examinee is, upon request in written form, granted inspection of his/her examination records by the examination board. § 29 of the Administrative Procedures Law of the "Land" Northrhine-Westphalia (VwVfG-NRW) remains in effect.

(2) The examination board decides about the place and time of the inspection.

§ 24 Invalidation of the Master's Examination, Revocation of the Master's Degree

(1) Should an examinee have cheated in an examination and should this fact only be recognized after bestowal of the final certificate, the examination board can after the fact adjust the grades of the relevant examinations on which cheating occurred and also adjust the final mark and declare the Master's Examination either completely or partially as not passed.

(2) In case the prerequisites for the access to an examination were not satisfied but the examinee did not mean to deceive, and should the fact only become known after bestowal of the final certificate, then shall the deficiency be condoned through the passing of the examination. If on the other hand the examinee purposely deceived, then the examination board decides the ruling, under consideration of the Administrative Procedures Law of the "Land" Northrhine-Westphalia .

(3) The affected shall be given the opportunity to comment before a ruling is given.

(4) The incorrect final certificate shall be retracted and a new one shall be issued when indicated. If one or more examinations are declared "not passed" due to cheating, then along with the incorrect final certificate, the Master's Diploma and all other documents confirming the academic completion, shall be retracted. After a time period of five years after the bestowal a decision according to Par 1. and Par. 2 S. 2 is no longer possible.

(5) If the Master's Examination is declared in total as "not passed" the Master's Degree is to be revoked, and the final certificate, the Master's Diploma, and all other documents confirming the academic completion, are to be retracted.

§ 25 Additional Examinations

As long as not all of the examinations mentioned in § 9 Par. 2 have been completed, the students can upon request take examinations in additional modules of this study programme or in course offerings of other study programmes which do not belong to this course of study and which are not recognized within this course of study, but which are recognized in a course of study of the University of Bonn (additional subjects or modules). The results of the examinations in these additional subjects or modules will be included into the final certificate upon request of the student, however they will not be considered in the calculation of the final mark.

§ 26 Transition Regulations

- (1) Students who matriculate after these regulations take effect will study according to these regulations.
- (2) Students who are matriculated and who have not yet completed the Master's Examination when these regulations take effect, can
 - a) in written form request, in an irrevocable way, to switch to these examination regulations. Past earned examinations will be recognized according to § 8; the examination board will announce further details according to § 6 Par. 9.
 - b) continue their studies according to the old examination regulations. The tasks of the examinations office and the examination board, according to the examination regulations for the Master's course of study in Mathematics of 06 June 2007 (Official Proceedings, 37th year, No. 12, 20 June 2007), last modified by the second changes to the examination regulations for the Master's course of studies in Mathematics of 29 September 2010 (Official Proceedings, 40. Year, Nr. 20, 07 October 2010) will be observed by the examination board formed according to § 6 of these regulations.

§ 27 Date of Validity and Date of Issue

- (1) These examination regulations take effect on the day after their issue into the Official Proceedings of the University of Bonn.
- (2) The examination regulations for the Master's course of study in Mathematics of 06 June 2007 (Official Proceedings, 37th year, No. 12, 20 June 2007), last modified by the second changes to the examination regulations for the Master's course of studies in Mathematics of 29 September 2010 (Official Proceedings, 40. Year, Nr. 20, from 07 October 2010), become invalid after the 31.03.2016.

The Dean
of the Faculty of Mathematics and Natural Sciences
of the University of Bonn
University professor Dr. Ulf-G. Meißner

Issued based on the decision of the Faculty Board on 27 June 2012 and the Office of the Rector on 21 August 2012.

Bonn, 27.08.2012

The Dean
of the University of Bonn
University professor Dr. Jürgen Fohrmann

Appendix 3: Admission Regulations according to § 5 of the Master's Examination Regulations for the Master's Course in Mathematics

In case the number of participants on a course offering needs to be restricted due to the type or the purpose of the course, or due to any other reasons of research and teaching, and in case the number of applicants exceeds the given capacity, then the admission will be ruled in the following way:

Applicants are to be accommodated in the following order:

- Group 1:
Students who are matriculated as ordinary students at the University of Bonn, and who are listed for this course offering according to the Plan of Modules, and who are in the same semester as or in a higher semester than planned for this course offering according to the Plan of Modules, if they have
 - a) been admitted in the first semester too late for the registration for the course offering, or
 - b) not been accommodated at least one time before due to the drawing of lots;

- Group 2:
Students who are matriculated as ordinary students at the University of Bonn in the same semester as or in a higher semester than the semester listed for the course offering in the Plan of Modules, and who do not belong to Group 1.

- Group 3:
All other students who are matriculated as ordinary students at the University of Bonn and who can partake of this course offering according to the Plan of Modules;

- Group 4:
All other students.

The remaining admission requirements remain untouched. Within these groups – with the exception of Group 4 – those students have precedence who have the highest number of credit points for this course of study or for another course of study of the University of Bonn in which modules from this course of study are imported. After this, lots are drawn.