

CURRICULUM

for the

DOCTORAL PROGRAMME IN NATURAL SCIENCES

at the Faculty of Natural Sciences at the University of Graz

According to the resolution of the Curricular Committee for the ‘Doctorate of Natural Sciences’ dated 11 January 2011 (including minor amendments based on the written statement of the Vice-Rectorate of Teaching and Studies from 12 May 2011 and the discussion during the Senate’s curricular conference on 16 May 2011).

Legal basis:

Universitätsgesetz 2002 (UG 2002; 2002 Universities Act) in its currently valid version;
Bylaws of the University of Graz

§ 1 Aims and Qualification Profile

- (1) The aim of the Doctoral Programme in Natural Sciences is to provide students not only with an academic pre-professional education, but also with the ability to conduct independent scientific work, obtain novel findings and thus attain a leading position in research within fields of expertise of the Faculty of Natural Sciences of the University of Graz. Thus, the doctoral programme promotes the education and training of young scientists in the field of the natural sciences.
- (2) Doctoral candidates acquire the qualification to conduct scientific work in a research area of the natural sciences by means of an education that is comprehensive in scope and in depth. They gain the ability to recognize meaningful questions in the natural sciences, translate these into research projects and to conduct independent research in order to advance knowledge in their fields on an international level. In addition, they acquire the abilities to critically analyse, evaluate and formulate complex ideas in the respective subject. Graduates are early stage scientists, who are qualified to work on scientific research within and outside the university and are thus capable of contributing to the development of a knowledge society within an academic and professional context.

§ 2 Admission and Duration of Studies

- (1) Admission to the programme is granted by the Rectorate. Besides meeting the general regulations pursuant to § 60 and § 63, UG 2002 (2002 Universities Act), students are required to provide proof of their general university entrance qualification for doctoral programmes (§ 64 para. 4, UG 2002):
 - a) Completion of a diploma or master's programme (in natural sciences) in a relevant subject at the University of Graz, or
 - b) completion of a study programme at a recognised domestic or foreign post-secondary educational institution that is equivalent to the programmes mentioned in letter a), or
 - c) completion of a diploma or master's programme (in natural sciences) in a relevant subject at a university of applied sciences, or
 - d) completion of a bachelor's programme (in natural sciences) in a relevant subject at the University of Graz (according to § 64 para. 4a, UG), or

- e) completion of a study programme at a recognised domestic or foreign post-secondary educational institution that is equivalent to the programmes mentioned in letter d).
- (2) If equivalency is met in general and there are only a few supplementary courses missing to reach full equivalency, admission to the doctoral programme can be based on the condition that the candidate must complete specific additional courses as part of the candidate's doctoral studies. Their scope and content is determined by the Rectorate in consultation with the doctoral school responsible for the subject.
 - (3) Admission pursuant to para. 1, letter c) is granted for the purpose of achieving equivalency with a university diploma or master's programme by fulfilment of supplementary curricular requirements of up to 2 semesters or 44 semester hours. In case full equivalency with a university diploma or master's programme is not achieved in compliance with the maximum of 44 semester hours, the student cannot be granted admission to the doctoral programme.
 - (4) Admission pursuant to para. 1, letters d) and e) is granted in accordance with the "Rectorate's guidelines concerning proof of the student's general university entrance qualification for doctoral programmes through completion of a bachelor's programme" under provision of possible requirements for the completion of additional courses as part of the doctoral programme.
 - (5) When a doctoral candidate is admitted pursuant to paragraph 1, letters a) or b), the doctoral programme is comprised of one stage of study that lasts 3 years. When a doctoral candidate is admitted pursuant to paragraph 1, letter c), the doctoral programme can last up to two semesters longer.

§ 3 Registration for the Doctoral Programme

- (1) In order to be admitted to the doctoral programme candidates have to register with the Dean of Studies.
- (2) When registering for the doctoral programme, the candidate must present the following together with the application for admission:
 - a) proof of fulfilment of admission requirements (previous studies);

- b) for non-EU citizens, eligibility to pursue a relevant doctoral programme in their home country;
 - c) description of the dissertation project with specification of the (tentative) title of the thesis;
 - d) specification of the prospective compulsory subject and, if possible, of the elective one;
 - e) proposal for the doctoral school in which the doctoral programme will be pursued;
 - f) proposal of an academic supervisor.
- (3) The dissertation topic must be taken from the existing fields of doctoral studies at the Faculty of Natural Sciences or in a doctoral school and must be chosen in agreement with the academic supervisor. Furthermore it must be reasonably connected with the candidate's previous studies or it can also be selected from available project proposals.
- (4) A dissertation project that requires financial or material resources of an institute can only be approved, if the director of the institute has been informed about it and the director does not prohibit it due to the expectation that the project will cause substantial interference with the teaching and research of the institute.
- (5) The registration documents are to be sent to the coordination team of the doctoral school in which the dissertation project will be performed.
- (6) The coordination team makes a recommendation for the registration confirming the feasibility of the dissertation project, the agreement of the proposed supervisor, the fulfilment of the curricular part of the doctoral programme regarding the compulsory subject and, if possible, the elective one, as well as specifying supplementary curricular requirements when necessary.
- (7) During the registration process, the respective doctoral school shall, in particular, verify and ensure that the candidate can present proof of sufficient German or English language proficiency in order to complete the curricular part of the doctoral programme as well as any other requirements and to carry out the dissertation project.

- (8) The Dean of Studies sends the registration documents including all recommendations as well as the application for admission to the Rectorate.
- (9) By the admission it is agreed that the doctoral school, which the doctoral candidate is assigned to, assumes responsibility for the feasibility of performing the dissertation project, guarantees appropriate guidance by a supervisor, and assures the possibility of fulfilling the curricular part of the doctoral programme as well as any other requirements.

§ 4 Courses and Examinations

- (1) For fulfilment of the curricular part of the doctoral programme in natural sciences students must complete at least the following:
 - a) Compulsory subject:

12 semester hours from the courses offered at the respective doctoral school in the subject/subject area of the topic of the dissertation, of which 6 to 8 semester hours have to be completed through the "Doctoral Seminar" (*Dissertanten/innen-Seminar*) of the respective doctoral school.
 - b) Elective subject:

4 semester hours of courses chosen for their relevance to the topic of the dissertation. Elective courses can be selected from the subjects of the respective doctoral programme, from closely related subjects/subject areas, and, consistent with the aims of interdisciplinary training and reflection, from courses of womens' and gender studies, philosophy, philosophy of science or other relevant areas. The Dean of Studies decides on their admissibility.
 - c) Additionally required subjects:

If admission to the doctoral programme has been granted on the basis of the regulations in § 2 para. 1 letters c to e or para. 2, subjects must be chosen to fulfil the respective number of hours necessary to complete the additional courses required as part of admission to the programme.
- (2) Students, who have been admitted with supplementary curricular requirements, shall complete the additional workload as specified.

- (3) Successful completion of the compulsory and elective subjects consists of positive evaluation of the respective course examinations. Doctoral Seminars (*Dissertanten/innen-Seminare*) have a continuous examination modus.
- (4) Every doctoral school plans courses on an advanced post-graduate level in addition to the regular Doctoral Seminar (*Dissertanten/innen-Seminar*) (usually 2 semester hours per semester). These courses must be suited to consolidate the student's knowledge in the respective dissertation subject and to expand the student's knowledge beyond the core subject area. The total number of courses offered of this kind shall be no less than 8 semester hours per academic year for each doctoral school depending on the number of doctoral candidates and dissertation subjects. The planning of the doctoral courses shall be presented for the two following academic years and is to take into consideration the doctoral candidates' academic needs.
- (5) Every doctoral candidate shall fulfil the requirements pursuant to paragraph 4 primarily by selecting courses offered by the candidate's doctoral school. If required, part of the requirements can also be fulfilled with courses offered at another doctoral school at the Faculty of Natural Sciences. When appropriate, courses from other subject areas and other universities or research institutions can be completed and accredited to fulfil the curricular requirements.
- (6) In order to expand the candidates' educational horizons, completion of dedicated study and research programmes at other national and international educational and research facilities is recommended.

§ 5 Dissertation

- (1) In the doctoral programme a dissertation must be written. The dissertation of the doctoral candidate exceeds the requirements of a diploma thesis. The dissertation demonstrates that the candidate has acquired the ability to independently solve current scientific problems and has contributed new findings. The dissertation must be an independent, original academic work that has been prepared and written by the student himself/herself. The latter point has to be confirmed by the student in a preamble to the dissertation. The dissertation can also be written on the basis of

publications that have already been published or have been accepted for publication (publication-based dissertation).

- (2) The dissertation must contain the new scientific findings of the work completed by the doctoral candidate and present the results and their interpretation within the context of the current state of scientific research in the respective field. The studies conducted shall be documented, and the findings shall be presented in a generally comprehensible form. The style of the dissertation shall comply with the usual standards of the field. For collaborations or group work, the individual contribution of the doctoral candidate must be clearly differentiated, and each doctoral candidate contributing to the work is required to submit a separate dissertation.
- (3) For publication-based dissertations, the respective publications must be prefaced with an introduction to the research issues and followed with a summary of the specific results of the research performed. The candidate has to clearly describe how the dissertation results are relevant to the respective field of research and how they fit within the context of the field. In any case the following criteria must apply for a publication-based dissertation:
 - a) A publication-based dissertation must include at least three publications that have been published or have been accepted for publication in refereed scientific journals.
 - b) In the case of co-authorship, the doctoral candidate's work must constitute the major share of at least one of the publications (60% or more) and at least a considerable share of the other publications (not less than 20%). The doctoral candidate's own contributions to the respective publications shall be indicated by the candidate and confirmed by the co-authors. The dissertation assessors shall be notified of these percentages.
 - c) Methods, experimental conditions, data analyses, solution methods etc. that are not included or explicitly stated in the publications, must be described in sufficient detail in the descriptive part of a publication-based dissertation, e.g. in the form of appendices.
- (4) The doctoral candidates shall work under the guidance of a supervisor. One of the supervisor's main tasks is to promote the doctoral candidate's capacity to perform research independently and contribute new findings.

- (5) Furthermore a mentor is to be appointed. The mentor supports the doctoral candidate as well as the supervisor regarding adequate training as well as effective supervision, and he/she monitors the progress of the dissertation.
- (6) Every university instructor from the respective doctoral school who holds a teaching qualification can be appointed as supervisor or mentor, as long as the instructor's teaching qualification includes the subject/subject area of the topic of the dissertation.
- (7) If required, professionals holding a teaching qualification from another university or research facility can also be appointed as supervisors with the consent of the Dean of Studies, but only if their teaching qualification is regarded to be equivalent to a teaching qualification at the Faculty of Natural Sciences according to § 98 para. 12 or § 103 UG and includes the subject/subject area of the dissertation topic. In this case, the respective person will be co-opted into the respective doctoral school.
- (8) If required, retired university teachers holding a teaching qualification, professors with emeritus status, or persons holding a teaching qualification from another university or research facility can also be appointed as mentors with the consent of the Dean of Studies, but only if their teaching qualification is regarded to be equivalent to a teaching qualification at the Faculty of Natural Sciences according to § 98 para. 12 or § 103 UG and includes the subject/subject area of the dissertation topic. In this case, the respective person will be co-opted into the respective doctoral school.
- (9) It is possible to change the dissertation topic, supervisor or mentor up until submission of the dissertation. The proposed change and the reasons for it must be submitted to the Dean of Studies in writing and must be decided by him/her. In case of approval, the coordination team of the respective doctoral school as well as the supervisor are to be informed about the decision of the Dean of Studies.
- (10) Publication (of parts) of the dissertation in scientific journals is recommended and permitted even prior to its assessment. However, this does not exempt the student from submitting a final comprehensive dissertation.

- (11) The completed dissertation shall be submitted to the Dean of Studies, who will present it to at least two assessors holding an appropriate teaching qualification or an equivalent qualification. The doctoral candidate is entitled to propose assessors. If required, it is permissible that one of the two assessors holds a teaching qualification from a subject that is closely related to the dissertation subject. The assessors shall assess the dissertation within a period of no more than four months.
- (12) Normally, one assessor is the supervisor. One of the assessors should come from outside the University of Graz. Not all of the assessors can be affiliated with the same institute (for large institutes, with the same department). Besides expertise in the field (teaching qualification according to § 98 para. 12 or § 103 UG at the Faculty of Natural Sciences or equivalent qualification), particular attention shall be paid to selecting unbiased assessors. The assessors must provide independent evaluations.
- (13) In case the dissertation is given different grades by the assessors, the arithmetic mean of the proposed grades is to be calculated and the result must be rounded to an integer number. Results greater than x.5 shall be rounded up. If one of the two assessors evaluates the dissertation negatively, the Dean of Studies must consult a third assessor. If the third assessor evaluates the dissertation negatively, the thesis must be rejected.
- (14) The assessors' reports and the resulting grade have to be presented to the student in writing.
- (15) Pursuant to § 86, para. 1, UG, the dissertation shall be made publicly accessible prior to the awarding of the academic degree at least by submitting one complete copy to each the University Library and the National Library.; in any case, an electronic version must also be made available.
- (16) Pursuant to § 86, para. 2 UG, the doctoral student can apply to have public access to the dissertation restricted for a maximum of five years from the time of submission. The governing body responsible for study law must grant this petition as long as the student can substantiate that unrestricted access would pose a threat to important legal or economic interests of the student. The members of the respective doctoral school shall be notified if a dissertation has been restricted.

§ 6 Additional Academic Qualification

- (1) In terms of comprehensive education and training of young scientists, acquisition of qualifications in academic teaching is considered desirable. Doctoral candidates can and should be integrated into academic teaching to an appropriate extent during their doctoral studies.

§ 7 Final Examination (*Rigorosum*)

- (1) The doctoral degree requirements are completed with a *rigorosum*, as a public defence of the thesis and an examination before a committee of examiners.
- (2) Students are entitled at any time to register for the *rigorosum* at the Dean of Studies as soon as the following prerequisites are met:
 - a) Positive completion of all course examinations of the curricular part of the doctoral programme pursuant to § 4 and, where applicable, completion of additional supplementary curricular requirements as specified upon admission;
 - b) positive assessment of the dissertation.
- (3) For the doctoral thesis defence, the Dean of Studies has to appoint an Examination Senate made up of at least three examiners. One member of the Examination Senate is to be appointed as chairperson.
- (4) When registering for the *rigorosum*, students are entitled to apply for certain examiners as well as the desired examination date. These applications should be taken into consideration by the Dean of Studies.
- (5) In any case, the assessors of the dissertation must be appointed as examiners in the Examination Senate. All of the examiners making up the Examination Senate must hold a teaching qualification for the respective subject of the dissertation or a teaching qualification for a relevant, closely related subject. Examiners from outside the University of Graz must hold a teaching qualification or an equivalent qualification in the respective subject, which is considered to be equivalent to a teaching qualification according to § 98 para. 12 or § 103 UG at the Faculty of Natural Sciences.

- (6) The composition of the Examination Senate and the functions of the examiners are to be communicated to the student no later than three weeks prior to the date of the doctoral thesis defence. The date of the examination must be publicly announced at least two weeks in advance.
- (7) The doctoral thesis defence consists of the following examination components:
 - a) The candidate communicates the dissertation results in an oral presentation and defends them as part of a general discussion (*defensio dissertationis*);
 - b) An oral examination of the subject area of the dissertation by the Examination Senate.
- (8) The doctoral thesis defence shall be conducted in the form of a public oral examination involving the entire Examination Senate lasting a maximum of one and a half hours. The first examination component pursuant to paragraph 7, letter a, a total of about 60 minutes should be devoted to.
- (9) During the doctoral thesis defence, the candidate must demonstrate academic skills, as well as extensive familiarity with the central problems of the dissertation subject.
- (10) The chairperson of the Examination Senate is responsible for the procedure of the doctoral thesis defence and for documenting the minutes of the examination. The minutes must include the examination subjects pursuant to paragraph 7, the place and time of the examination, the names of the members of the Examination Senate, the name of the student, the questions asked and the respective assessments, in particular the reasons for any negative assessment, and finally any other notable incidents.
- (11) The consultations and the decision on the result of the *rigorosum* with regard to all examination components is to be carried out in a non-public meeting of the Examination Senate following a discussion among its members in compliance with the provisions pursuant to § 73, paras. 1 and 2, UG. The decisions of the Examination Senate are reached by majority vote. The chairperson shall have the same voting right as the other members; however, the chairperson is the last person to cast a vote. During the vote, every member of the Examination Senate shall take into consideration the results from both examination subjects as well as the overall impression of the doctoral thesis defence.

- (12) If the Examination Senate does not reach an unanimous decision on the assessment of the *rigorosum*, the assessments proposed by its members must be added up, the sum divided by the number of members, and the result rounded to an integer number. Results greater than x.5 are to be rounded up.

§ 8 Overall Assessment

- (1) The completion of the doctoral thesis defence is followed by an overall assessment of the doctoral programme. For this, the following must be taken into consideration:
- a) the grade obtained from the arithmetic mean of the assessments of the courses in the curricular part pursuant to § 4,
 - b) the grade obtained from the arithmetic mean of the assessments of the dissertation, and
 - c) the grade of the doctoral thesis examination.
- (2) The overall assessment is “*bestanden*” (passed) if all three grades are positive. If this is not the case, it is “*nicht bestanden*” (failed). It is “*mit Auszeichnung bestanden*” (passed with distinction) if none of the three grades are worse than “*gut*” (2 = good) and at least two of the grades are “*sehr gut*” (1 = very good).

§ 9 Doctoral Degrees and Doctoral Graduation Ceremony

- (1) Upon successful completion of the doctoral thesis defence, the governing body responsible for study law awards graduates of the doctoral programme in natural sciences with the academic degree of “*Doktorin der Naturwissenschaften*” or “*Doktor der Naturwissenschaften*”, which is abbreviated as “Dr. rer. nat.” (derived from the name of the title in Latin, *Doctor rerum naturalium*). Irrespective of doctoral graduation ceremonies, the degree must be awarded officially by written notification immediately or no later than one month after the doctoral thesis defence.
- (2) In any case, the notification of degree must contain the following details:
- a) Family name, first name(s) and, if applicable, birth name;
 - b) Date of birth and citizenship;
 - c) Completed study programme with denotation of the compulsory and elective subjects as well as the title of the dissertation;
 - d) Academic degree awarded.

- (3) An acquired additional scientific qualification pursuant to § 6 should be certified in a separate confirmation.

§ 10 Coming into Effect

- (1) This curriculum came into effect on 1 October 2007.
- (2) Amendments to this curriculum came into effect on 1 October 2011.

§ 11 Interim Regulations

- (1) Students who have begun their doctoral programme prior to 1 October 2007 shall be entitled to complete their studies pursuant to § 124 para. 15 UG by no later than 30 September 2017. If students do not complete their studies by 30 September 2017, they must pursue their further studies according to this curriculum in its respective currently valid version. During admission periods, these students furthermore shall have the right to adopt this curriculum in its valid version at any time.
- (2) Examinations as part of the Doctoral Programme in Natural Sciences that were taken before this curriculum came into effect shall be recognised for the Doctoral Programme in Natural Sciences according to this curriculum by the responsible body pursuant to § 78 UG with regard to their equivalency with the examinations stipulated in this curriculum in its respectively valid version.