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Curriculum

for the

Doctoral Program in Natural Sciences at the Faculty of Environmental, Regional and Educational Sciences

Amendment

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Curriculum

for the Doctoral Program in **Natural Sciences**

at the Faculty of Environmental, Regional and Educational Sciences of the University of Graz as amended in 2016 (16W)

The legal basis of the Doctoral Program in Natural Sciences at the Faculty of Environmental, Regional and Educational Sciences is the Austrian Universities Act (*Universitätsgesetz, UG*) and the Statutes of the University of Graz (*Satzung der Karl-Franzens-Universität Graz*). The senate has issued the following curriculum for the Doctoral Program in Natural Sciences at the Faculty of Environmental, Regional and Educational Sciences on April 20, 2016 according to § 25 subsection 1 number 10 of the Austrian Universities Act (*UG*).

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§ 1 Objectives and qualification profile

(1) The subject areas of the disciplines established at the Faculty of Environmental, Regional and Educational Sciences are situated specifically at the interface between the natural and cultural world. Therefore, for immanent academic reasons, they combine research traditions from the natural, social, cultural and human sciences. Interdisciplinary approaches are developed that combine these traditions. This methodological diversity is reflected in three curricula that represent the three “typical” established research cultures and that provide students of all faculty disciplines the opportunity to specialize according to their intended educational profile.

(2) The objective of the doctoral program is an outstanding education for junior scientists by international standards. Beyond academic pre-professional education, the program is designed to impart to junior scientists the ability to conduct independent scientific work and to lead and to contribute substantially to the forefront of current research through the independent acquisition of knowledge over the course of researching for and writing the dissertation. This kind of proficiency qualifies program participants to engage in practical fields of action as well as to take on occupational management positions that require academic professional and methodical competence.

(3) The orientation of the doctoral program towards the achievement of original academic work implies that participants require the skills to:

- address current research questions within the discipline by developing research projects and answering these questions through independent research work
- cultivate the necessary cooperative projects and contacts – where necessary interdisciplinary – who keep abreast of the current scientific discourse within the academic community (e.g. conference participation)
- critically analyze, evaluate and synthesize complex ideas within the relevant field of expertise and in terms of their overall development within historical and social contexts.

(4) The Doctoral Program in Natural Sciences provides and promotes theoretical understanding of and methodical competence in academic work in the field of the natural sciences. The subject is nature in its animate and inanimate form and the goal is to describe, measure and explain these two aspects. The acquired skills are of significance for research in the field of the natural sciences and for the practice in various work areas. Key areas of focus: formulating hypotheses, designing experiments, analytical and quantitative methods, especially methods drawn from the field of mathematics and physics, paradigms of logic, modeling and simulation, computer-aided data processing and visualization.

§ 2 Admission and duration of study

(1) Admission to the program is granted by the Rector's Office after consulting the competent doctoral school. If there is no competent doctoral school, admission is granted by the Rector's Office after hearing the Curricular Committee. In this case, the program is to be completed without being assigned to a particular doctoral school.

One of the following degrees from an accredited national or international post-secondary educational institution is required to admission:

- a. a degree from a diploma program of relevant expertise or an equivalent program worth at least 240 ECTS credits or
- b. a degree from a master's program in a relevant subject worth at least 60 ECTS credits. The completed bachelor's or master's degree must comprise 300 ECTS credits or 10 semesters with courses related to the area of specialization if no ECTS credits are established in the curriculum.

Recommendations for exceptions to items a and b can be put forward by the Curricular Committee to the Rector's Office.

(2) If overall equivalence is found and only some additions are necessary to ensure full equivalence, the Rector's Office is entitled to require examinations to determine equivalence. Those exams must be taken during the doctoral program. These requirements must be met within the first two semesters of the relevant doctoral program.

(3) Admission on condition of completion of examinations is granted in order to achieve equivalence with an academic diploma or master's degree that has complementary curricular requirements of up to 40 ECTS credits. If an academic diploma or master's degree does not achieve equivalence despite requirements up to 40 ECTS credits, admission to the doctoral program is not possible.

(4) Admission of persons with a mother tongue/language of instruction other than German is granted according to the relevant regulations of the Rector's Office concerning the admission of international students to degree programs at the University of Graz. For the admission to a doctoral program, a German proficiency certificate is not required if teaching and supervision are offered in the relevant foreign language to a sufficient degree and if proficiency in German is not necessary for undertaking the program successfully.

§ 3 Application

(1) After admission to the doctoral program it is necessary to register with the Dean of Studies.

(2) Students should apply for a dissertation topic at the Dean's Office no later than after two semesters. The doctoral student must provide the following application details:

a) Working title of the proposed dissertation

b) Suggestion of a supervisor and a mentor and a supervision agreement. It must be signed by the doctoral student, the supervisor and the mentor;

c) Declaration of the core course and the prospective elective course;

d) Suggestion of the doctoral school that offers the doctoral program;

e) Suggestion of a dissertation topic (pursuant to the statute section on legal requirements pertaining to studies § 28 subsection 3 and 6) by submitting a proposal for the dissertation project.

(3) The dissertation topic shall cover a research question from the natural sciences concerning a field of expertise of the Faculty of Environmental, Regional and Educational Sciences and is to be chosen in agreement with the supervisor while maintaining a reasonable correlation to the completed degree program and/or must be chosen from among existing proposals.

(4) The use of financial or material resources of a department for a dissertation project is only permitted if the head of the department is informed and he/she didn't refuse the use of these resources owing to significant interference with teaching and research activities.

(5) The application is to be forwarded to the coordination team of the doctoral school where the dissertation will be completed.

(6) The coordination team issues a statement on the application that confirms in particular

the feasibility of the dissertation proposal, the assistance from a supervisor, the compliance with the curricular aspect of the doctoral program when it comes to core and – if possible – elective courses.

§ 4 Courses

(1) The curricular component of the Doctoral Program in Natural Sciences contains the following core courses:

a) Core courses: Doctoral students are required to take the following number of courses in natural sciences from the range offered at the relevant doctoral school in the area/sub-area covering the dissertation topic:

24 ECTS credits, 8 ECTS credits thereof for doctoral colloquia (*Doktoratskolloquium*), at least 8 ECTS credits for doctoral seminars and at least 4 ECTS credits for privatissima (*Privatissimum*) at this doctoral school.

b) Elective courses: Courses worth 8 ECTS credits that are to be chosen with respect to the thematic relevance to the dissertation topic. Elective courses may be chosen from the area of the relevant doctoral program, a related area/sub-area or, in the interest of interdisciplinary education and reflection, also from women's and gender studies, philosophy, science theory, organization management or other relevant areas. The Dean of Studies decides whether or not the intended course is admissible.

(2) Students who are admitted to a doctoral program on condition of additional exams must meet these extra requirements.

(3) Every doctoral school must offer doctoral colloquia, doctoral seminars and privatissima to enable students to earn 24 ECTS credits during the doctoral program. 8 ECTS credits are allotted to doctoral colloquia, at least 8 ECTS credits to doctoral seminars and at least 4 ECTS credits to privatissima. The remaining 4 ECTS credits are not bound to a specific type of course. The total offer of these courses at a doctoral school should amount to at least 16 ECTS credits per academic year depending on the number of doctoral students and dissertation subjects.

(4) Each and every doctoral student must attend the doctoral courses pursuant to subsection 3 of his/her doctoral school. Where appropriate, some of these courses can be selected from the course catalog of another doctoral school at the Faculty of Environmental, Regional and Educational Sciences or the Faculty of Natural Sciences. In addition, courses from other fields of expertise and other universities and research institutions can be counted towards a degree where needed.

(5) After consulting with the supervisor of the dissertation and if permitted by the responsible organ in accordance with the relevant legal requirements pertaining to studies, a maximum of courses worth 12 ECTS credits can be replaced by academic achievements.

These academic achievements include:

a) Presentation or poster presentation at an academic symposium

b) Contribution to an academic journal or an edited volume (publication of the master's or diploma thesis is excepted from academic alternative achievements)

c) Participation in a research oriented methods workshop (e.g. at the Methodenkompetenzzentrum in Graz)

If the dissertation is submitted in the form of a thesis by publication parts of the dissertation cannot be used as a replacement for courses.

(6) The curriculum establishes the following types of courses:

a) Doctoral colloquium (*DQ*): Doctoral colloquia are intended to review and discuss the proposed dissertation. It is especially worthwhile to involve external researchers in colloquia.

b) Lectures (*VO*): Courses intended to convey knowledge through a presentation by a lecturer.

c) Seminars (*SE*): Seminars promote academic discourse. The participants make a personal contribution to the course. In order to complete the seminar, students are in general required to submit a paper.

d) Conversation Classes (*KV*): Courses that allow for discussions and questions addressed to the lecturer.

e) Privatissima (*PV*) are specialist research seminars.

- (7) For didactic reasons the number of participants is restricted for individual types of courses as follows:
 - a) Doctoral colloquium (*DQ*): limited to 15 participants.
 - b) Lectures (*VO*): no limit.
 - c) Seminars (*SE*): limited to 15 participants.
 - d) Privatissima (*PV*): limited to 10 participants.

Students register for courses online through the electronic examination and administration system of the University of Graz. If for logistic reasons it is not possible to offer sufficient parallel courses and the maximum of participants is reached, students are admitted if the participation of the course is necessary to achieve the performance record they need according to the curriculum. The following order applies: core courses before restricted electives before free electives. If the number of registrations that are not set back outnumbers the available seats, students with further academic progress are prioritized. Academic progress is determined by already earned ECTS credits. Further ranking, if needed, is based on the number of relevant semesters. Students with more completed semesters are prioritized. If there is still no clear ranking after this procedure, available seats are assigned by lot. Ten percent of available seats are to be reserved at the beginning of a course for students who take part in international exchange programs, students with other curricula at the University of Graz and students suffering severe hardship.

(8) To expand their educational horizons, we recommend to students that they attend dedicated study and research programs at other national and international educational and research institutions and to spend some time abroad. Regulations pursuant to § 78 subsection 5 of the Austrian Universities Act (*UG*) for pre-determining the equivalence in the form of a so-called “pre-notification” (*Vorausbescheid*) apply.

(9) As an element of internationalization, some courses of the curriculum should be held in English if feasible.

(10) For the purpose of an excellent education of junior scientists it is considered desirable to achieve skills in academic teaching. Doctoral students can and should be involved in academic teaching activities to a reasonable extent during their doctoral program.

§ 5 Establishment of doctoral programs

Doctoral programs can be established for the Doctoral Program in Natural Sciences at the Faculty of Environmental, Regional and Educational Sciences of the University of Graz (see “Richtlinie des Studiendirektors über die Einrichtung und den Betrieb von Doktoratsprogrammen an der Karl-Franzens-Universität Graz”). Doctoral programs are binding interdisciplinary structures that provide a thematic and organizational frame for research and teaching during the doctoral program. They don’t supersede the individual assistance of a supervisor but rather offer an additional organization and support structure.

§ 6 Examination regulations I: Mandatory and elective courses

(1) To successfully complete the core and elective courses it is necessary to pass the relevant course examinations. Doctoral colloquia (*DQ*), doctoral seminars (*SE*) and privatissima (*PV*) require attendance and utilize a continuous assessment method.

(2) Courses that don’t require attendance and continuous coursework (*VO*) are completed with only one examination that can be oral or written or oral and written. Courses of the type *DQ*, *SE*, *KV* and *PV* require attendance and continuous coursework. They are completed by assessment of the continuous coursework and other requirements that are announced at the beginning of the course by the lecturer.

§ 7 Examination regulations II: Dissertation

(1) All students in the doctoral program must write a dissertation. The doctoral student demonstrates in the dissertation his/her ability to address academic questions and to solve problems prevalent in current research in an independent manner. The dissertation forms an independent academic piece of scholarship that is drafted and written by the student autonomously. The latter is to be confirmed by the student in a preamble to the dissertation.

(2) The dissertation can either be submitted in the form of a monograph or a thesis by publication. In case of a monograph, completed parts of the dissertation should be presented during the course of the doctoral program to a relevant, preferably international community, for example by means of lectures and/or poster contributions at conferences including the publication of corresponding abstracts or papers in conference

proceedings. Academic papers published or submitted in this manner are to be considered part of the dissertation. In the case of a thesis by publication, the doctoral school has to approve the individual supervision agreement. In any case, the thesis by publication must consist of at least two publications, one of them as lead author that has already to be accepted for publication (in press) and one at least as co-author, which must have passed the first review successfully (accepted with revisions). The papers must be published in ISI journals or other mediums of publication considered equivalent by the relevant doctoral school. These must be announced by the respective doctoral school as a guideline. In the event of an amendment to this guideline, students have the possibility to change to the current version. If a program is not attributed to a doctoral school the curricula commission undertakes this task. The thesis by publication has basically the same objectives as a monograph, that is to say the proof of the ability to master research questions independently. Hence, a thesis by publication comprises a series of topic-related academic publications that demonstrate the independent original work of the doctoral student. In addition, an introductory chapter is to be composed that describes the problem, the objectives of the paper (in terms of findings), the scientific relevance of the topic, the current state of knowledge as well as the methodical approaches. Subsequent to the publication, a summary of the key findings and a conclusion are to be written.

(3) The dissertation must set out the new scientific findings from the conducted research of the doctoral student and present them in the context of the current state of scientific research in the relevant field of expertise. The conducted studies must be well documented and the findings must be presented in a comprehensible way. The dissertation style should follow the prevailing standards in the field of expertise. In the case of collaborations or teamwork, the contribution of the doctoral student must be evident.

(4) The dissertation is completed under the guidance of a supervisor. One of the supervisor's main responsibilities is to lead the doctoral student to independent scholarship in order to reveal new findings. Every university lecturer from the relevant doctoral school can be chosen as supervisor if his/her authorization to teach covers the area/sub-area of the dissertation topic.

(5) A mentor is to be chosen. The doctoral student has the right to choose a mentor. It is the mentor's responsibility to support the doctoral student and the supervisor with regard to the former receiving an adequate education and an effective supervision, and to monitor the progress of the dissertation project. Every university lecturer from the respective doctoral school can be chosen as mentor if his/her authorization to teach covers the area/sub-area of the dissertation topic.

(6) Upon approval by the Dean of Studies, persons with an authorization to teach at another university or research institution can be chosen as supervisor or mentor as and when required if their authorization to teach is equal to the authorization to teach of the relevant doctoral school and comprises an area/a sub-area that matches the dissertation topic. In this case, the person concerned will be coopted to the respective doctoral school.

(7) If the doctoral program is offered in cooperation with other universities or under an individual supervision agreement with another university, the contractual provisions apply for the supervision.

(8) It is possible to change the dissertation topic, the supervisor or the mentor until submission of the dissertation upon approval of the Dean of Studies. In order to do so, it is necessary to inform the Dean of Studies in writing about the request and provide reasons for this decision.

(9) Publication of (parts of) the dissertation in academic journals is allowed and recommended even before the dissertation is graded. This, however, does not replace the final dissertation.

(10) Students must submit the completed dissertation to the Dean of Studies. The Dean of Studies presents the dissertation to at least two examiners who hold a relevant authorization to teach or are equally qualified. The doctoral student has the right to suggest an examiner. If necessary, one of the two examiners who are to be chosen can be authorized to teach in a subject closely related to the dissertation subject. The examiners must grade the dissertation in a period of maximum four months.

(11) The supervisor is generally an examiner (primary examiner). One of the examiners should be from outside the University of Graz if possible. If both examiners work at the same department, at least one other examiner from outside the University of Graz has to be appointed. When selecting an examiner, not only is his/her qualification crucial, but it is also crucial that he/she meets the requirement of impartiality. The examiners shall produce independent reports.

(12) If the examiners grade the dissertation differently, they still have to come to a decision concerning the grade. If they cannot agree on the grade, the arithmetic mean of the suggested grades is to be calculated and the result to be rounded up/down to the nearest whole number. Results above x.5 are to be rounded up. If one examiner decides that the dissertation has failed, the Dean of Studies is to consult another examiner. If this

additional examiner decides the dissertation has failed, the dissertation shall be rejected.

(13) The reports and the result of the assessment must be delivered to the student in writing.

(14) Pursuant to § 86 subsection 1 of the Austrian Universities Act (*UG*), a complete copy as well as an electronic version of the dissertation must be submitted to the university library and the national library in order to be publicly accessible.

(15) Pursuant to § 86 subsection 2 of the Austrian Universities Act (*UG*), the doctoral student can request upon submission of the dissertation that the dissertation be withheld for a period of no longer than five years. The governing body responsible for legal requirements pertaining to studies shall grant the request if the student demonstrates that immediate publication would jeopardize his/her legal or economic interests. The members of the relevant doctoral school are to be informed about the dissertation embargo.

§ 8 Examination regulations III: Oral examination

(1) A public oral examination by a committee completes the doctoral program. The final oral examination is worth 4 ECTS credits.

(2) The student is entitled to register for the oral examination whenever he/she fulfills the following conditions:

- a) a passing grade on every course examination of the curricular part of the doctoral program according to § 4 and if applicable additional supplementary achievements due to requirements as part of the admission;
- b) a passing grade on the dissertation.

(3) The Dean of Studies shall appoint a committee of at least three persons for the oral examination. The primary examiner is also member of the committee. Other examiners need not be members of the Committee. One member of the committee shall be appointed chair.

(4) The student is entitled to request examiners and an examination date when he/she registers. The Dean of Studies shall take those requests into consideration as far as possible.

(5) Each and every examiner who is a member of the Examination Committee must hold an authorization to teach in the relevant field of expertise that covers the dissertation topic or a relevant field that is close to it.

(6) The members of the Examination Committee and the examiners need to be disclosed to the student no later than three weeks before the oral examination. The examination date shall be announced publicly no later than two week prior to the examination.

(7) The oral examination consists of the following parts:

a) Presentation of the dissertation findings in the form of an academic speech by the candidate as well as a defense of the findings as part of a general discussion (*defensio dissertationis*).

b) Oral examination on the subject area (core and elective course) of the dissertation conducted by the committee.

(8) The oral examination shall be conducted in the form of a public oral exam by the entire examination committee and shall take no longer than 90 minutes, 60 minutes of which shall be used for the first part according to subsection 7 a).

(9) The candidate must demonstrate his/her academic aptitude and his/her profound knowledge of the key issues of the dissertation topic in the course of the oral examination.

(10) The chair of the Committee must ensure that the exam is conducted in an orderly fashion and must record the examination. The record must include the examination subjects according to subsection 7, place and time of the examination, the names of the members of the Examination Committee, the name of the candidate, the questions posed and the relevant grading, especially reasons for a failing grade as well as special incidents.

(11) According to § 73 (1) and (2) of the Austrian Universities Act (*UG*), all parts of the oral examination are discussed and voted on at a non-public meeting of the Examination Committee after consultation with the members. The Examination Committee decides by a majority vote. The chair is allowed to vote like the other members, but he/she shall be the last one to cast his/her vote. The members of the Examination Committee must take into account the results of both examination subjects as well as the overall impression of the oral examination when voting.

(12) If the Examination Committee does not agree on a grade for the oral examination, the grades proposed by the members are to be added up and the sum is to be divided by the number of members. The result is

rounded up/down to the nearest whole number. Results above x.5 must be rounded up.

§ 9 Examination regulations IV: Overall assessment

(1) After the oral examination an overall assessment of the doctoral program shall be made.

For this purpose, the following components are taken into account:

- a) the computed grade according to the arithmetic mean of the courses in the curricular part pursuant to § 4,
 - b) the computed grade according to the arithmetic mean of the dissertation and
 - c) the grade of the final oral examination.
- (2) To pass the overall assessment, all three components above must receive a passing grade. Otherwise the student has failed the overall assessment. Students are eligible to graduate “with honors” if none of the grades are less than “good” (*gut*, 2) and at least two grades are “very good” (*sehr gut*, 1).

§ 10 Academic degree

After successful completion of the final oral examination, the governing body responsible for legal requirements pertaining to studies shall award the graduate of the Doctoral Program in Natural Sciences at the Faculty of Environmental, Regional and Educational Sciences the academic degree “Doctor of Natural Sciences,” “Doctor rerum naturalium“ in Latin, abbreviated “Dr. rer. nat.,” regardless of academic celebrations on the occasion of the doctorate. The official notice shall be issued immediately and no longer than one month after the final oral examination.

§ 11 Effective date

- (1) This curriculum comes into effect from October 1, 2011. (Curriculum 11W)
- (2) Amendment of this curriculum, disclosed in the bulletin from 04/27/2016, Issue 30g, 51st Special issue; comes into effect from October 1, 2016. (Curriculum 11W, as amended in 16W)

§ 12 Transitional provisions

Students of the Doctoral Program in Natural Sciences at the Faculty of Environmental, Regional and Educational Sciences who are subject to the former curriculum 11W when the amended curriculum comes into effect on 10/01/2016 shall change to the amended curriculum on 10/01/2016.