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Doctoral Degree Regulations of the Department of Construction and Culture of the Graduate School for Applied Research in North Rhine-Westphalia

from 14.03.2023

Based on § 67b (3) and § 67 (3) of the Higher Education Act of the State of North Rhine-Westphalia (Hochschulgesetz – HG) of September 16, 2014, as amended by the Act Amending the Higher Education Act of July 12, 2019 (GV. NRW. p. 377) and the Framework Doctoral Degree Regulations of the Graduate School for Applied Research in North Rhine-Westphalia of January 31, 2023 (RPO), the Department Council of the Department of Construction and Culture has issued the following doctoral degree regulations:

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§ 1 Scope of application

(1) These doctoral degree regulations apply to all doctoral procedures carried out in the Department of Construction and Culture of the Graduate School for Applied Research in North Rhine-Westphalia. The Department of Construction and Culture offers the doctoral program Built Environment and Cultural Heritage. Insofar as no provisions have been made in these doctoral degree regulations, the corresponding rules of the framework doctoral degree regulations of the Graduate School for Applied Research in North Rhine-Westphalia apply.

(2) In the case of interdepartmental doctoral topics, a department is appointed whose doctoral degree regulations are used for the procedure. The supervisors, reviewers and members of the examination committee are appointed in such a way that the departments involved are represented accordingly.

§ 2 Conferral of doctoral degrees

(1) After passing the doctoral examination, the Department of Construction and Culture awards one of the following academic degrees in the doctoral program "Built Environment and Cultural Heritage"

1. Doktor der Ingenieurwissenschaften (Doktor-Ingenieur – Dr.-Ing.)
Doktorin der Ingenieurwissenschaften (Doktor-Ingenieurin – Dr.-Ing.)
Doktor*in der Ingenieurwissenschaften (Doktor-Ingenieur*in – Dr.-Ing.)
2. Doktor der Naturwissenschaften (Doctor rerum naturalium – Dr. rer. nat.)
Doktorin der Naturwissenschaften (Doctor rerum naturalium – Dr. rer. nat.)
Doktor*in der Naturwissenschaften (Doctor rerum naturalium – Dr. rer. nat.)
3. Doktor der Philosophie (Doctor philosophiae – Dr. phil.)
Doktorin der Philosophie (Doctor philosophiae – Dr. phil.)
Doktor*in der Philosophie (Doctor philosophiae – Dr. phil.)

(2) The academic degree of Doktor der Ingenieurwissenschaften (Doktor-Ingenieur – Dr.-Ing.), Doktorin der Ingenieurwissenschaften (Doktor-Ingenieurin – Dr.-Ing.) or the degree of Doktor*in der Ingenieurwissenschaften (Doktor-Ingenieur*in – Dr.-Ing.) is awarded if the dissertation is predominantly of an engineering nature; the academic degree of Doktor der Naturwissenschaften (Doctor rerum naturalium – Dr. rer. nat.), Doktorin der Naturwissenschaften (Doctor rerum naturalium – Dr. rer. nat.) or the degree of Doktor*in der Naturwissenschaften (Doctor rerum naturalium – Dr. rer. nat.) is awarded if the dissertation is predominantly of a scientific nature; the academic degree of Doktor der Philosophie (Doctor philosophiae – Dr. phil.), Doktorin der Philosophie (Doctor philosophiae – Dr. phil.) or the degree of Doktor*in der Philosophie (Doctor philosophiae – Dr. phil.) is awarded if the dissertation is predominantly of a humanities nature. The decision is made by the responsible doctoral examining committee.

§ 3 Purpose and form of the doctorate

(1) The doctorate serves as proof of the ability to carry out in-depth academic work in one of the department's specialist areas. The doctorate is based on independent academic work (dissertation) and an oral examination (disputation).

(2) The doctorate takes place within the framework of the doctoral program specified in § 2 (1). Compulsory courses must be completed as part of the doctoral program and proof of participation must be provided. These are part of the requirements for admission to the doctoral procedure.

(3) Doctorates can also be carried out across departments.

(4) The duration of the doctorate should not exceed five years. In justified cases, the doctoral examining committee may extend the period by up to two times by one year each time on application submitted before expiry; the application must be accompanied by a justification and a statement from the supervisors responsible for the subject. Upon expiry of the maximum permissible duration of the doctorate, admission to the doctorate expires, unless the doctoral procedure has already been initiated. Protection periods and leaves of absence in accordance with § 20 are not counted towards the duration of the doctorate.

§ 4 Doctoral examining committee

(1) The composition, responsibilities and working methods of the doctoral examining committee are regulated in § 4 of the RPO.

(2) Nominations for the doctoral examining committee can be submitted by candidates themselves by means of a declaration of intent or by proposals from the department.

§ 5 Admission requirements

(1) Access to the doctoral procedure is granted to those holding

- a) a degree after a relevant university degree course with a general standard period of study of at least eight semesters, for which a degree other than "Bachelor" is awarded, or
- b) a degree after a relevant university degree with a general standard period of study of at least six semesters and subsequent appropriate studies in the doctoral subjects in preparation for the doctorate or
- c) a degree from a Master's degree program within the meaning of HG § 61 (2) sentence 2

which was obtained for the Dr. rer. nat. in a natural science subject, for the Dr.-Ing. in an engineering subject or for the Dr. phil. in a humanities, cultural studies or design subject. If, due to the content of the doctoral project, a degree other than the degree awarded is appropriate, the doctoral examining committee will decide on this upon application.

If the qualified degree in accordance with sentence 1 a) to c) was not obtained in one of the degree programs listed there, the doctoral examining committee may exceptionally admit the applicant to doctoral studies, provided that the other admission requirements are met

- d) having completed the degree qualifying for a doctorate with a grade of 2.5 or better. In the event of a lower grade, the doctoral examining committee may order a written assessment which indicates the candidate's suitability for doctoral studies on the basis of subject-related criteria, and
- e) having not already been accepted as a doctoral candidate or admitted to doctoral studies in the same academic subject at another faculty or university and having not already passed a corresponding doctoral examination in the same academic subject at a university.

(2) If admission to the doctoral procedure is granted in accordance with § 5 (1) b), the doctoral examining committee shall determine the modules and examinations to be taken as part of the preparatory studies for the doctorate, taking into account the completed degree and the envisaged dissertation topic. The required scope of performance may not exceed the number of ECTS credits required for a consecutive Master's degree. The modules and examinations originate from the relevant Master's degree programs of the sponsoring universities. The pre-doctoral studies are passed if all modules and examinations to be taken have been successfully completed. The requirements must be fulfilled by the start of the doctoral procedure, unless another deadline is specified.

§ 6 Acceptance as a doctoral candidate

- (1) Acceptance as a doctoral candidate is regulated in § 6 of the RPO.
- (2) Acceptance is initially limited to five years and can be extended up to two times by one year each time upon application, provided that the supervisors of the thesis recommend this and confirm that the doctoral project can be successfully completed.

§ 7 Supervision

- (1) Supervision is regulated in § 7 of the RPO.
- (2) In the case of interdisciplinary projects, the supervisor assigned to the subject area is responsible for content-related questions in the respective subject area.
- (3) In the case of interdisciplinary doctoral projects, the supervisors are appointed in such a way that the disciplines involved are represented accordingly.
- (4) The supervision agreement only becomes effective upon acceptance as a doctoral candidate.

§ 8 Opening of the doctoral procedure

The opening of the doctoral procedure is regulated in § 8 of the RPO.

§ 9 Reviewer

- (1) The appointment and exclusion of reviewers is regulated in § 9 of the RPO.
- (2) For interdisciplinary doctoral projects, the reviewers are appointed in such a way that the disciplines involved are represented.

§ 10 Examination board

The composition and working methods of the examination board are regulated in § 10 of the RPO.

§ 11 Dissertation

- (1) Writing and assessment of the dissertation is regulated in § 11 of the RPO.
- (2) As a rule, the dissertation must be written in German or English. In special cases, other languages may be permitted if it is ensured that reviewers and examiners who are proficient in the relevant language can be appointed in accordance with §§ 9 and 10. If the dissertation is written in a language other than German or English, a summary in German or English must always be included.
- (3) In the case of a cumulative dissertation, at least three specialist articles written during membership of the Graduate School, which have been accepted by internationally recognized journals with scientific quality control and at least one of which has been published, must be submitted as a dissertation. The results of this work must meet the requirements for a dissertation and be presented in an internal scientific context. The submitted essays must be preceded by a joint introduction on the state of relevant research, the issues investigated, the main findings and a discussion of the research contribution. All articles should be written by a single author, whereby the supervisor of the dissertation is not counted. If there is no sole authorship, the exact contribution of the candidate must be described in the introduction in order to recognize the ability to work independently.
- (4) The deadline for submitting the dissertation and the reviews to the department in accordance with § 11 (9) of the RPO may be shortened at the request of the doctoral candidate if there are serious reasons for doing so.

§ 12 Disputation

- (1) The conduct and assessment of the disputation is regulated in § 12 of the RPO.

(2) As a rule, the oral examination must be held in German or English. The doctoral examining committee decides on exceptions.

§ 13 Overall grade of the doctorate

The determination of the overall grade of the doctorate is regulated in § 13 of the RPO.

§ 14 Completion of the doctorate and certificate

The completion of the doctorate is regulated in § 14 of the RPO.

§ 15 Publication of the dissertation

The publication of the dissertation is regulated in § 15 of the RPO.

§ 16 Withdrawal from the defense

Withdrawal from the defense is regulated in § 16 of the RPO.

§ 17 Deception and revocation of the doctorate

The procedure for cheating and withdrawal of the doctorate is regulated in § 17 of the RPO.

§ 18 Inspection

Inspection is regulated in § 18 of the RPO.

§ 19 Appeal against decisions in the doctoral procedure

Appeals against decisions in the doctoral procedure are regulated in § 19 of the RPO.

§ 20 Protection periods

Information on protection periods can be found in § 20 of the RPO.

§ 21 Compensation for disadvantages

Information on compensation for disadvantages can be found in § 21 of the RPO.

§ 22 Retention of examination documents

The storage of examination documents is regulated in § 22 of the RPO.

§ 23 Doctorate in joint supervision with universities entitled to award doctorates and joint awarding of degrees

Doctorates in joint supervision with universities entitled to award doctorates and joint degree conferral are regulated in § 23 of the RPO.

§ 24 Cooperative doctorates with universities not authorized to award doctorates

Cooperative doctorates with universities that are not authorized to award doctorates are regulated in § 24 of the RPO.

§ 25 Entry into force

Issued on the basis of the resolution of the Department Council of 14.03.2023. The regulations come into force on the day after their announcement in the Official Notices of the Graduate School for Applied Research in NRW.

Aachen, 14.03.2023

The Chairwoman of the Department Council

signed *Stöckert*

(Prof. Dr. Ulrike Stöckert)

Attachment

Doctoral program Built Environment and Cultural Heritage

Annex: Structured doctoral program Built Environment and Cultural Heritage of the Department of Construction and Culture in the Graduate School NRW

The Built Environment and Cultural Heritage doctoral program covers the research fields of building technology and construction, infrastructure and space and culture. It is primarily aimed at Doctoral candidates with a degree in technical, natural or engineering sciences as well as a degree in design, humanities or cultural studies disciplines such as architecture, design, heritage conservation and conservation science.

The demands of sustainable use of natural resources, minimizing energy use and CO₂ emissions during the construction, operation and dismantling of buildings are key drivers of research and development. This includes issues relating to energy efficiency and resource conservation in both existing and new buildings. For example, research into historical and traditionally intelligent construction techniques and principles as well as their further development and reinterpretation using contemporary materials, processes and methods must be taken into account.

The technical infrastructure is also part of the further development of construction. In order to guarantee the future viability of our settlement and building structures, efficient solutions must be developed to ensure, for example, adaptability to demographic change and climate change while meeting high requirements in terms of quality and security of supply. In this context, the increasing availability and appropriate use of data in the course of digitalization also play a major role.

The mutually constitutive research fields of culture and space deal with the theories, history and practices of designing and shaping landscapes, cities, buildings, spaces, objects and artifacts as well as the preservation and mediation of art and cultural assets. This includes a critical discourse that deals both qualitatively and quantitatively with relevant questions on global urbanization processes and their transformation challenges, on ecological sustainability, on new forms of participation and collaboration in design and planning as well as on models and utopias of the urban future.

A key role is played by building in existing contexts and, in particular, the preservation of historical monuments and cultural heritage. By studying the conditions of origin, materials and techniques, histories of use as well as historical and contemporary contexts of art and cultural assets, buildings and spaces, a broader understanding of their functions and significance is gained, but also for the development and testing of forward-looking strategies and methods of conservation and restoration. In this context, the development of a transdisciplinary and methodical vocabulary between subjects, cultures and orders of art, building and spatial production as well as the preservation of cultural assets also plays a major role.

Aim of the doctoral program

Participation in the doctoral program “Built Environment and Cultural Heritage” provides the opportunity to write a dissertation in a structured manner in conjunction with a qualification program. Seminars, workshops and presentations with compulsory and optional elements are an integral part of the program.

With the completion of the dissertation and the associated proof of the ability to carry out independent academic work, Doctoral candidates acquire various skills:

Discipline related skills (specialist skills)

This includes the acquisition of application-oriented specialist knowledge and methods at a high scientific level and their adaptation to master subject-specific tasks and interdisciplinary challenges by linking cultural-theoretical and historical analyses with design and technical aspects. Examples of additional qualification modules could be

- BIM methodology and virtual twin
- Machine learning and artificial intelligence
- Digital measurement and building recording technology
- new participatory methods and techniques
- Digital monument and restoration technologies

Doctoral candidates are integrated into an academic environment with researchers and professors, so that on completion of their doctorate they are both proficient in their own specialist field and have a broad and well-founded knowledge of the subject area.

Research skills (research competencies)

At the same time, Doctoral candidates acquire the skills to quickly acquire new knowledge and familiarize themselves with new subject areas. On completion of their doctorate, Doctoral candidates are able to develop scientific tasks, work on them using scientific methods, present the results accurately and discuss them in a scientific environment. They make a contribution to scientific progress in their field.

Various methodological skills for scientific work are acquired. In the doctoral program “Built Environment and Cultural Heritage”, for example, these are skills in the areas of data collection, analysis and management, digital documentation and analysis methods as well as simulation techniques. The skills required to solve complex scientific problems in basic and applied research in the aforementioned areas are taught at a high international level.

Transferable skills

Another aim of the doctoral program is to teach interdisciplinary and personal skills in preparation for a future career. These include moderation and presentation skills as well as self-management, which includes the ability to plan ahead and prioritize tasks correctly. Social skills for the development of self-reflective, strategic and tactical approaches to achieve relevant goals are also acquired. On completion of the doctorate, Doctoral candidates are able

to design and work on research projects, set up and lead project teams and transfer research results and innovations into practice.

To acquire specialist and research skills, the members of the doctoral program offer events in the form of projects and academic seminars. In addition, specific courses at the participating universities, at the Graduate School NRW as well as external courses and seminars can be attended and recognized within an appropriate framework.

Structure of the doctoral program

The three-year doctoral program consists of a compulsory area (Table 1) and an elective area (Table 2). The courses can also be offered and attended as online courses.

The lecture series takes place annually. Topics such as energy-efficient and resource-conserving construction, the design of living spaces with simultaneous protection of nature and the environment, building in existing buildings and the preservation of cultural heritage are key components of interdisciplinary research in the department. In the lecture series, these individual scientific sub-areas are presented in a cross-sectional manner with regard to existing connections, interrelationships and synergies. It offers a broad exchange on the scientific developments of building and conservation in all its technical and cultural facets and conditions, including new digital methods. As part of these events, experts will report on current research activities.

In order to promote early academic independence, it is recommended that Doctoral candidates take part in a methods workshop in their first year in order to acquire the specialist knowledge specifically required for their doctoral thesis. These are selected in consultation with the supervisors according to the needs of the Doctoral candidates. For example, the development and application of algorithms for data processing and analysis as well as the plausibility check of data and research data management are required for a large number of scientific questions. For other topics, the collection of qualitative data using social science methods or the learning of participatory methods may play a role.

In the second and third year, Doctoral candidates should take part in specialist events in order to learn new research methods, actively participate in subject-related communication and gain knowledge of current research activities. Here, participation in summer schools is possible, which are offered annually at various universities within and outside the PK NRW. The European Union's summer schools (e.g. COST), which are aimed specifically at Doctoral candidates, are also a good option.

Participation in national or international specialist symposia is also possible, which offer presentations on current research developments as well as scientific exchange in the form of workshops and seminars. Numerous members of PK NRW are actively involved in national or international committees, associations and organizations and can facilitate access and specialist offers. Examples include the Graz Construction Management and Construction Industry Symposium, the conferences of Docomomo International, the Koldewey Society, the Society for the History of Building Technology, the Association of Restorers and others.

A full-day research colloquium is held once a year to promote professional exchange between all Doctoral candidates. Here, the participants present and discuss methodological approaches, analytical procedures and results of their previous scientific research work.

The following schedule of the doctoral program (compulsory and elective areas) is recommended:

1st year:

- Formation of a supervisory team of three people, conclusion of a supervision agreement
- Coordination of the scientific concept, consisting of the working hypothesis and solution approaches for the preparation of the dissertation, as well as the time and work plan
- Participation in the events “Good Scientific Practice” and “Ethics and Responsibility in Society”
- Lecture series on changing topics
- Presentation of own research in the research colloquium for Doctoral candidates
- Participation in a methods workshop is recommended, whereby the range of topics depends on the wishes/requirements of the doctoral candidates. The methods workshop or participation is organized independently by the doctoral candidates. Methods workshops at the supporting universities can be attended or experts can be invited. Examples of workshop topics are “Application of ML/KI methods” or “BIM”. There is also the opportunity to exchange and further develop the existing specialist knowledge of individual participants (e.g. programming languages).

2nd year:

- Presentation of your own research at an external scientific conference
- Written progress report and discussion, update of the time and work plan of the supervision agreement
- Research colloquium for doctoral candidates
- Participation in at least one further specialist event/workshop (e.g. summer schools, specialist conference or symposium) is recommended.

3rd year:

- Written progress report and discussion, update of the time and work plan of the supervision agreement
- Presentation of own research in the research colloquium for Doctoral candidates
- It is recommended to participate in at least one specialist event/workshop (e.g. summer schools, specialist conference or symposium) with your own presentation
- It is recommended to write a scientific conference paper or peer-reviewed article

Publication activities and research visits are encouraged and supported. The professors work in various national and international specialist committees and are actively involved in the organization of specialist events, conferences and congresses (e.g. annual conference of the European Center for Sustainable Mobility, Road and Transport Research Association). Doctoral candidates are involved in these activities and the scientific environment as part of their doctorate. This is intended to ensure and promote the successful publication of research results.

Further training courses must be chosen independently and agreed with the supervisor.

Table 1: Mandatory area

Event	Notes
Event on good scientific practice	Should be done at the beginning if possible
Event on ethics and responsibility in society	
Lecture series on changing topics	
Two presentations of your own research as part of the annual research colloquia for Doctoral candidates	
Presentation of your own research at an external scientific symposium	
Annual written progress report and discussion, updating the schedule and work plan	Mandatory components of the supervision agreement

Table 2: Possible elements in the elective area

Technical and methodological qualification events
Subject-specific methods workshop, e.g. "Application of ML/KI methods" or "Participatory methods"
Conferences
In-depth specialist event, e.g. summer school
Further presentation of your own research at a national or international symposium
Participation in national or international conference (without own contribution)
Workshops/Events
Interdisciplinary qualification workshop, university didactic workshop, advanced training, summer school, language course, etc.
Publications
Article in a recognized journal
Publication in other organs (e.g. conference proceedings)
Publication of a review
Editorship of a conference volume or similar.
Transfer services
Information event or workshop for companies, the public sector or organizations
Application for a patent
Founding a start-up
Miscellaneous
Implementation of a course
Research stay with a connection to a research institution or university
Internship in an area that is relevant to your future career
Organization of conferences/events/exhibitions
Activities in academic self-administration and committee work (e.g. office of doctoral candidate spokesperson, membership of appointment committee)