



Curriculum of the Doctoral Programme in Natural Sciences

Curriculum version of 2024

The changes to this curriculum for the Doctoral Programme in Natural Sciences were approved by the Curricular Committee for Doctoral and Postgraduate Programmes at the meeting of 10 June 2024.

The Senate of Graz University of Technology issues the Doctoral Programme in Natural Sciences on the basis of the Universities Act 2002 (UG), originally published in the Austrian Federal Law Gazette (BGBl.) No. 120/2002 and applicable as amended, and the Excerpt of Statutes: Legal Regulations for Academic Affairs of Graz University of Technology.

Please note: the English version of this document is a courtesy translation. Only the German version is legally binding.

§ 1 Objective and Qualification Profile

(1) Beyond pre-professional education, the objective of the Doctoral Programme in Natural Sciences (German title: *Doktoratsstudium der Naturwissenschaften*) at Graz University of Technology is to develop students' ability to conduct advanced, independent scientific research in the fields of competence of TU Graz. Graduates of this degree programme are awarded the academic degree "Doktorin der Naturwissenschaften" or "Doktor der Naturwissenschaften" (Doctor of Natural Sciences), abbreviated as "Dr. rer. nat.". In accordance with § 54 (4) Universities Act 2002 (UG), the international equivalent of this university degree is "Doctor of Philosophy", abbreviated as "PhD".

(2) Qualification profile

Graduates of the Doctoral Programme of Natural Sciences of TU Graz have advanced and perfected the ability to formalise problems in the engineering or natural sciences and to develop research-guided analyses and solution approaches. They are thus capable of performing high-level scientific work independently.

Graduates can work in a team and take on coordinating and managerial functions in engineering or natural sciences research, both in a university and in a private industry setting. They have a broad knowledge base as well as an area of in-depth specialisation and are thus able to expand and innovatively implement their scientific knowledge in different fields of applications.¹⁾

¹ ¹⁾ All footnotes refer to the explanatory notes in the Appendix.

§ 2 Admission, Workload and Duration of Study

(1) Admission to the doctoral programme is granted by the Rector and, in addition to the general requirements stipulated in § 60 and § 63 of the Universities Act 2002 (UG), requires the following in accordance with § 64 (4) and (5) of the Universities Act 2002:

1. completion of a relevant diploma or master's degree programme in engineering or the natural sciences at a university, or
2. completion of another degree programme of at least the same higher-education level at a recognised domestic or foreign post-secondary educational institution that does not significantly differ in subject matter from the above-mentioned degree programmes, or
3. completion of a degree programme of at least the same higher-education level at a recognised domestic or foreign post-secondary educational institution in conjunction with supplementary examinations, or
4. completion of a relevant bachelor's degree programme at a university in accordance with § 64 (5) of the Universities Act 2002.

In cases of admission according to (4), the requirements of the Rectorate's guideline on proof of general eligibility for admission to a doctoral programme on the basis of a bachelor's degree programme (German title: *Nachweis der allgemeinen Universitätsreife für die Zulassung zu einem Doktoratsstudium durch den Abschluss eines Bachelorstudiums*) also apply as admission requirements.

Applicants who graduated from degree programmes that do not meet the criteria set out in (1) and (2) may be asked to complete additional supplementary courses in order to be admitted. The officer responsible for study matters determines the scope and content of these supplementary courses in consultation with the coordinators of the respective Doctoral School (see § 3).²⁾

(2) If a doctoral candidate is admitted in accordance with (1) lines 1. or 2, the doctoral programme is scheduled to last three years (standard duration of study). However, if a doctoral candidate is admitted in accordance with (1) line 3, the duration of study for the doctoral programme is extended by up to two semesters. The duration of study may be shortened if all criteria specified in the curriculum have been met and all imposed additional academic achievements have been fulfilled. Any shortening of the duration of study requires written approval by the officer responsible for study matters.

(3) The Doctoral Programme in Natural Sciences is offered as a foreign-language programme in the English language.

§ 3 Doctoral Schools

(1) Doctoral Schools are specialist committees responsible for implementing the subject-specific details of the doctoral degree programme curriculum. Every Doctoral School covers a wider subject area along with its sub-disciplines. Doctoral Schools may also be established across faculties or in cooperation with other universities. In such cases, the teaching responsibilities according to § 6 must be shared in mutual consultation between the participating faculties or universities.³⁾

(2) In the admission process, every doctoral candidate is assigned to a Doctoral School. The doctoral candidate has the right to propose the Doctoral School of their choice. As a rule, the doctoral supervisor should be a member of this doctoral school⁴⁾.

(3) Each institute of Graz University of Technology is assigned to a Doctoral School, and every Doctoral School comprises the following groups:

1. the group of university professors of the institutes assigned to the respective Doctoral School,
2. the group of associate professors, adjunct professors, academic staff with “venia docendi” teaching qualification, assistant professors who have concluded a Qualification Agreement and senior scientists of the institutes assigned to the respective Doctoral School, and
3. the group of doctoral candidates of the respective Doctoral School as well as those assigned to the Doctoral School.

The Doctoral Schools are established after approval by the Curricular Committee for Doctoral and Postgraduate Programmes and submission to the Senate by the Curricular Committee. A coordination team and a head of the Doctoral School are then appointed for each Doctoral School.

(4) The coordination team drafts the statutes of the Doctoral School. These statutes specify the contents of the curricular workload of the doctoral programme in accordance with § 6 and, in cross-faculty and cross-university Doctoral Schools, determine the guidelines for cooperation. The subject-specific educational objectives and qualification profiles are also outlined in these statutes. The Curricular Committee for Doctoral and Postgraduate Programmes then approves the statutes and presents them to the Senate.⁵⁾

§ 4 Rights and Duties of Doctoral Supervisors and Doctoral Candidates

(1) As part of the admission procedure, the doctoral candidate must submit a confirmation of supervision. Once the doctoral candidate is accepted into the Doctoral School, an educational agreement is concluded containing a brief description of the proposed doctoral project. This educational agreement must be signed by the doctoral candidate, the doctoral supervisor, any possible co-supervisors and the officer responsible for study matters. The educational agreement must be concluded as soon as possible, usually within 3–6 months, but no later than 12 months after admission to the doctoral programme. The proposal for a dissertation project and a work plan must be presented publicly in an appropriate form within the first year.⁶⁾

(2) The supervisor confirms with a personal signature that, according to the supervisor’s expertise in the subject area, the proposed doctoral project can be completed within the scheduled period.

The doctoral candidate agrees with a personal signature to observe the guidelines of TU Graz ensuring good scientific practice. Both confirm with a personal signature that they acknowledge the curriculum for the doctoral programme and the statutes of the corresponding Doctoral School.

(3) The supervisor’s duties include guiding the doctoral candidate towards independent scientific work. This includes encouraging independent scientific publication.

(4) The doctoral candidate and the supervisor must discuss the progress made on the doctoral thesis at regular intervals. Either party may request meetings in person.

The doctoral candidate submits an annual written progress report on the doctoral project to the doctoral supervisor. The supervisor comments on this report in writing.

The reports and statements must be made available to all members of groups 1 and 2 of the Doctoral School listed in § 3 (3).⁷⁾

(5) The doctoral candidate has the right to ask one or more suitable people for advice and support in the doctoral project. These people are nominated by the doctoral candidate.⁸⁾

(6) Failure to submit a doctoral thesis within five years after admission to the doctoral programme requires justification in the relevant report and a statement by the doctoral supervisor in accordance with § 4.⁹⁾

(7) In serious cases, the doctoral supervisor is entitled to submit an application to the officer responsible for study matters to resign as supervisor. The application must be accompanied by a justification and is made public within the Doctoral School. Before resignation, however, the coordination team should be consulted.¹⁰⁾

(8) In cases of irreconcilable differences of opinion between the doctoral candidate and the supervisor during the doctoral project, both parties are entitled to appeal to the officer responsible for study matters as the arbitration authority. Before arbitration, however, consultation with the coordination team has to be sought.

(9) A justified change of supervisor(s) is possible until submission of the doctoral thesis. The change requires approval by the officer responsible for study matters.

§ 5 Doctoral Thesis

(1) In the course of the doctoral programme, doctoral candidates must write a doctoral thesis which proves their ability to tackle new scientific problems independently.

In the admission procedure, the doctoral candidate proposes a working title for the doctoral thesis and the desired Doctoral School in consultation with the doctoral supervisor. A short description of the proposed doctoral thesis must be made available to all members of groups 1 and 2 of the Doctoral School listed in § 3 (3).¹¹⁾

(2) The doctoral thesis is assessed according to the criteria established in § 31 (5)–(7) of the Excerpt of Statutes: Legal Regulations for Academic Affairs of TU Graz. In consultation with the officer responsible for study matters, the coordination team of the Doctoral School preselects the evaluators. The supervisor and the doctoral candidate have the right to propose evaluators. At least one evaluator must come from outside Graz University of Technology. At least one evaluator must not be an employee of the same institute at Graz University of Technology. All members of groups 1 and 2 of the Doctoral School according to § 3 (3) must be informed by the coordination team about the pre-selection of evaluators and have the right to comment on the selection.¹²⁾

(3) Pre-selection of the evaluators should be completed at least two months before submission of the doctoral thesis. From this point on, all evaluators are to be provided with a preliminary version of the doctoral thesis. Upon submission of the doctoral thesis, the officer responsible for study matters initiates the final assessment of the doctoral thesis by the selected evaluators. They must then grade the doctoral thesis according to the applicable rating system pursuant to § 72 (2) Universities Act 2002 (UG).¹³⁾

(4) The doctoral thesis must be submitted for assessment in electronic form. All guidelines of Graz University of Technology concerning layout and binding of the doctoral thesis must be followed.¹⁴⁾

(5) The doctoral thesis must present the new scientific knowledge gained by the research performed and compare it with the current state of scientific research. The research work must be fully documented and the results presented in an understandable form. The structure of the doctoral thesis should follow the established standards in the field. If the doctoral thesis is based on group work as defined in § 83 (2) in conjunction with § 81 (3) of the Universities Act 2002 (UG), the doctoral candidate's share of work must be clearly stated, and each doctoral candidate involved must submit an individual doctoral thesis. It is recommended that the doctoral thesis is written in the language commonly used for publication in the corresponding field of study.¹⁵⁾

(6) The publication of completed parts in international scientific media is recommended, including before the assessment of the doctoral thesis. If proof of such publications cannot be provided at the time that the evaluators are appointed, a minimum of three reviewer reports must be obtained for assessment of the doctoral thesis, at least one of which must come from an evaluator external to TU Graz. However, even if the doctoral thesis has already been published in part, the final completed thesis must still be submitted for assessment and may take the form of a collection of several publications or a cumulative/compilation doctoral thesis ("Manteldissertation" in German). The doctoral thesis must contain a list of publications of the doctoral candidate.¹⁶⁾

(7) As a rule, the doctoral thesis (as a whole) must be made publicly available after the doctoral examination. Only in exceptional, justified cases can the doctoral candidate apply to the officer responsible for study matters for restriction of access of the doctoral thesis in accordance with § 86 (4) Universities Act 2002 (UG) (withholding of access / exclusion of use). The Doctoral School must be informed about the access restriction of a doctoral thesis.¹⁷⁾

§ 6 Curricular Workload

(1) The curricular workload of the doctoral programme amounts to 18 ECTS credit points as specified in (2) through (4). In justified cases, the statutes of a Doctoral School may require a higher curricular workload.¹⁸⁾

(2) Subject-specific basic courses (totalling 9 – 12 ECTS credit points from a catalogue of elective courses)

Each Doctoral School must offer courses at a high postgraduate level. These courses are intended to expand the doctoral candidate's knowledge of their own subject area beyond the specific subject of the doctoral thesis and introduce them to the current state of research in other areas.

1. Each Doctoral School must establish a catalogue of courses. The officer responsible for study matters, in consultation with the coordination team of the Doctoral School, assigns the courses.
2. The basic topics of these courses must be determined in advance to a large extent, and they must be offered at least every two years. The institutes of the Doctoral School must be involved in designing and updating these courses on a regular basis.
3. A preview of the courses for the doctoral programme for the following two academic years (respectively) must be announced in due time.
4. The doctoral candidate then selects the subject-specific basic courses primarily from the course catalogue of the candidate's Doctoral School according to § 3 (1). After application to the officer responsible for study matters and after consultation with the supervisor, courses from other subject areas or other universities may be chosen; this must be made public within the Doctoral School.¹⁹⁾

(3) Scientific Methods and Communication (totalling 4–7 ECTS credit points, compulsory)

1. The course(s) on “Scientific Methods” (2 ECTS credit points) is/are compulsory after the first academic year and is/are offered annually by each Doctoral School. The course reviews, teaches and discusses fundamental methods and conventions of research in the respective subject area.
2. The doctoral seminar (2 x 1 ECTS credit points) is compulsory after the first academic year and is offered annually by each Doctoral School. Professors of the Doctoral School take turns in directing the doctoral seminar. All doctoral students participate and present their thesis; all members of the Doctoral School are invited to participate as listeners. The purpose of the seminar is to support doctoral candidates in improving their public speaking, communication and presentation skills in their field of work. Attendance is mandatory.
3. From the existing catalogues of courses from various degree programmes, so-called “Soft Skill” courses (presentation techniques, rhetoric, etc.) may be selected for a maximum of 3 ECTS credit points, provided that they have not already been taken in the course of a previous degree programme.²⁰⁾

(4) Exclusive tutorial for doctoral candidates (“Privatissimum”, 2 ECTS credit points) is compulsory in the course of the doctoral programme and is usually offered by the supervisor of the doctoral candidate.

(5) The courses listed in (2) to (4) are assessed individually. The positive result of examinations is to be assessed as “excellent” (1), “good” (2), “satisfactory” (3) or “sufficient” (4) and the negative result as “unsatisfactory” (5). Only the doctoral seminar is to be assessed as “successfully completed” or as “not completed.”

(6) The courses of the curricular workload are combined into a single module. This module is successfully completed once all assigned course examinations have been passed successfully. The overall grade for this module is determined as the average of the individual grades of the course examinations, weighted by the ECTS credit points of the courses. The grade must be rounded up if the decimal place exceeds 0.5. Otherwise, the grade must be rounded down.²¹⁾

§ 7 Doctoral Examination

(1) The doctoral examination is the final examination in the doctoral programme. The date for the doctoral examination is set once proof of successful completion of all required courses according to § 6, of the annual reports according to § 4 (4) and of positive assessment of the doctoral thesis according to § 5 (3) has been submitted in compliance with the requirements in § 21 and § 23 of the Excerpt of Statutes: Legal Regulations for Academic Affairs of TU Graz. The doctoral examination is a public examination in front of a board of examiners consisting of at least three people, as defined in § 24 (2) of the Excerpt of Statutes: Legal Regulations for Academic Affairs as amended.

(2) The board of examiners is convened by the officer responsible for study matters in accordance with § 24 of the Excerpt of Statutes: Legal Regulations for Academic Affairs of TU Graz. The examiners do not necessarily have to be the evaluators, and they must not be employed at the same institute. They are proposed to the officers responsible for study matters by the coordinators of the doctoral school, taking into consideration the doctoral candidate’s right to propose examiners. The proposed board of examiners must be made public within the Doctoral School.

(3) The doctoral examination is an examination in two parts, consisting of

1. a presentation by the doctoral candidate of appropriate length on the scientific work conducted, and
2. an oral examination on the subject area of the doctoral thesis by the board of examiners.²²⁾

(4) The doctoral examination is assessed (graded) according to the criteria established in § 24 of the Excerpt of Statutes: Legal Regulations for Academic Affairs of TU Graz.

§ 8 Overall Assessment

Following the doctoral examination, the doctoral candidate is given an overall assessment for their academic performance in the doctoral programme. The overall assessment is based on the assessment of the doctoral thesis, the doctoral examination, and the curricular workload. The overall assessment is “passed” if all three grades are positive. If at least 50 % of the above-mentioned study achievements are assessed as “excellent” (1), and if none of the three grades is lower than “good” (2), the overall assessment is “passed with distinction”.²³⁾

§ 9 Transitional Provisions

(1) Students of the Doctoral Programme in Natural Sciences who are subject to the curriculum in its 2019 version when this curriculum enters into force on 1 October 2024, are entitled to complete their studies according to the provisions of the curriculum in its 2019 version by 30 September 2028. If the study programme is not completed by 30 September 2028, students become subject to the curriculum for the Doctoral Programme in Natural Sciences as amended.

(2) Students have the right to voluntarily switch to the current curriculum at any time within the specified admission deadlines. To this end, an irrevocable written declaration must be sent to the officer responsible for study matters.

(3) Admission to the Doctoral School and Doctoral Programme remains valid for students switching to this curriculum.

(4) When switching to the current curriculum, any academic achievements to which no ECTS credit points are allocated are recognised with 1 SSt = 1.5 ECTS credit points for subject-specific basic courses acc. to § 6 (2). Courses of Scientific Methods and Communication acc. to § 6 (3) and the exclusive tutorial for doctoral candidates acc. to § 6 (4) are recognised with 1 SSt = 1 ECTS credit point.

§ 10 Entry into Force

This current curriculum for the Doctoral Programme in Natural Sciences enters into effect on 1 October 2024. The amended provisions in § 3 and § 4 regarding the members of Doctoral Schools and the possibility of co-supervision are only applicable once the corresponding provisions in the Excerpts of Statutes: Legal Regulations for Academic Affairs and Organisation of Academic Affairs as well as the guidelines for the constitution of Doctoral Schools and the work of the coordination teams have entered into force.

Appendix: Explanatory Notes

Ad § 1 Objective and Qualification Profile

¹⁾ Further qualification aspects are detailed in the statutes of the Doctoral School, see § 3 (4).

Ad § 2 Admission, Workload and Duration of Study

²⁾ For the definition of “officer responsible for study matters”, see § 1 of the Excerpt of Statutes: Organisation of Academic Affairs of Graz University of Technology. The Vice Rector for Academic Affairs is the officer responsible for study matters and all study-related matters of the doctoral programme at Graz University of Technology. The Deans of Studies are authorised to perform this duty on behalf of the Vice Rector.

Ad § 3 Doctoral Schools

³⁾ The role of Doctoral Schools is largely advisory. Irrespective of this, Doctoral Schools play the important role of the primary scientific public of the doctoral activities in the respective subject area. Important procedures and contents, such as supervision, doctoral projects, and the appointment of evaluators, should be made visible in this context and should be discussed in order to ensure consistently high quality.

See § 6 of the Excerpt of Statutes: Organisation of Academic Affairs of TU Graz and the guidelines of the Curricular Committee for Doctoral and Postgraduate Programmes and the Senate on the constitution of Doctoral Schools and the work of the coordination teams.

⁴⁾ A Doctoral School is constituted with the goal of bringing together a “critical mass” of doctoral candidates in the same subject area, for whom the subject catalogue of the curricular workload in the Doctoral School is normally valid, see § 3 (4) and § 6. As a point of reference, there should be a total of 35 to 100 doctoral candidates per Doctoral School.

⁵⁾ See the guidelines of the Curricular Committee for Doctoral and Postgraduate Programmes and the Senate on the constitution of Doctoral Schools and the work of the coordination teams and the guideline for the layout of the statutes of Doctoral Schools.

It is recommended that the study matters of each Doctoral School should, as a rule, be assigned to the relevant Dean of Studies by authority of the officer responsible for study matters.

Ad § 4 Rights and Duties of Doctoral Supervisors and Doctoral Candidates

⁶⁾ Publication within the respective Doctoral School. The specific implementation is the responsibility of the Doctoral Schools.

⁷⁾ The purpose of the progress report and the statement is to monitor and evaluate the progress of the doctoral project in a helpful manner.

⁸⁾ These persons in mentorship roles do not need to have in-depth expert knowledge in the subject area of the doctoral project; they should come from the environment of the Doctoral School. The specific implementation is the responsibility of the Doctoral Schools.

⁹⁾ *This regulation aims to provide a mechanism for the official review of unsuccessful or de facto abandoned doctoral theses. It is explicitly accepted that, in justified cases (i.e., if a student is employed outside TU Graz and studies on a part-time basis), a doctoral thesis may take longer than five years to complete, as long as appropriate overall progress is made.*

¹⁰⁾ *However, the university is not obliged to assign a new supervisor. The degree programme cannot be completed without a new supervisor.*

Ad § 5 Doctoral Thesis

¹¹⁾ *In the interest of quality control, the short description (1–2 pages) should only propose reasonable and feasible doctoral thesis subjects. In addition, the short description allows for a critical evaluation of the progress made by the doctoral candidate. This does not, however, mean that the doctoral project cannot be extended and modified in the course of the work. Should the doctoral candidate be subject to additional curricular workload according to § 2 (1) 3, the submission of the short description can be postponed by the additionally required number of semesters.*

¹²⁾ *The appointment of evaluators should follow good scientific practice: As a rule, evaluators should be international experts to ensure that an established, independent opinion is obtained. In addition to expertise in the field, particular attention should be paid to impartiality when selecting evaluators.*

¹³⁾ *The two-month period for pre-assessment allows the evaluators to influence the doctoral thesis positively where applicable, rather than having to wait until the finalised doctoral thesis is presented to them. This way, the doctoral candidate has the chance to take any suggestions for improvement into consideration in due time.*

¹⁴⁾ *In addition, a Doctoral School may require in its statutes the submission of a fixed number of printed copies of the doctoral thesis.*

¹⁵⁾ *The regulations on writing the doctoral thesis are in the interest of good scientific practice. However, with respect to protecting intellectual property for doctoral theses from industry co-operations, it must be ensured that the interests of the scientific community are also protected and that the evaluators can actually assess the doctoral thesis. The typical and recommended language for doctoral theses in the technical and natural sciences is English.*

¹⁶⁾ *Scientific publications are an essential part of a doctoral candidate's work. It is assumed that usually when a doctoral thesis is submitted, one or more peer-reviewed publications have already been published or were accepted for publication; thus, the acceptance of parts of the doctoral thesis can be regarded as a positive preliminary assessment of the work. If, contrary to expectations, this is not the case, an additional quality control by a further external evaluator must be initiated. Due to the differing publication practices in the various academic disciplines, it is recommended to specify the relevant meaning of "international publication media" as well as the requirements for their reviewing practice in the statutes of the Doctoral Schools.*

¹⁷⁾ *In principle, restricting access to a doctoral thesis runs contrary to the idea of promoting science. It is recommended that this mechanism be used stringently (taking into account subject-specific practices).*

Ad § 6 Curricular Workload

¹⁸⁾ When determining the scope of the curricular workload, a sense of proportion is required both with regard to the size (number of doctoral candidates) of the Doctoral School and with regard to the assignment of teaching responsibilities. The number of ECTS credit points given below refers to the basic workload of 18 ECTS credit points. The variable amount of ECTS credit points in § 6 (2) and (3) is a result of the individual choices offered in § 6 (3) 2.

¹⁹⁾ These courses should not focus primarily on a narrow, high level of specialisation. The term “postgraduate level” refers to the way participants are challenged and supported. The total offer of these kinds of courses for each Doctoral School and academic year should be between 12 and 24 ECTS credit points, depending on the number of doctoral candidates of the Doctoral School. In the interest of promoting a diverse range of courses, it is recommended to limit the individual courses to 2 to 6 ECTS credit points worth of workload. The course catalogue can be checked to verify that the list of courses offered is up to date and, if needed, is revised every two to four years. Teaching assignment is the responsibility of the Dean of Studies, who has an obligation to ensure that the overall course offering is proportionate to the size of the Doctoral School. Doctoral candidates have the right to select courses as they see fit, subject to restrictions as outlined in § 2 (1) 3.

²⁰⁾ If the size (number of doctoral candidates) of the Doctoral School permits, it is recommended to combine the two courses from § 6 (3) 1 and 2 into one single course or seminar (scope: 2 ECTS credit points in the winter and summer semesters). Furthermore, doctoral candidates can be given the option to complete the work required for the doctoral seminar over a longer period of time.

²¹⁾ The purpose of combining the grades for the curricular workload into one single grade is to avoid individual grades excessively influencing the overall assessment (§ 8).

Ad § 7 Doctoral Examination

²²⁾ Each Doctoral School can establish uniform guidelines in their statutes determining how a doctoral examination should be conducted. For example, a presentation time of 30 to 45 minutes is considered appropriate. The oral examination should last approximately 20 minutes per examiner. The oral examination portion of the doctoral examination is a doctoral thesis defence with questions on the subject of the doctoral thesis and the related subject area.

Ad § 8 Overall Assessment

²³⁾ “Passed with distinction” is therefore only awarded if all three grades making up the overall assessment are “excellent” (1), or if two are “excellent” (1) and one is “good” (2).