

---

## Statutes applying to the award of doctorates at the Materialium Graduate School

---

The Materials Science and Geosciences Department's Materialium Graduate School offers research-oriented, doctorate programs culminating in award of the degree of "Dr.-Ing." or "Dr. rer. nat." The programs involved are configured to cover three years. The TU-Darmstadt's current regulations ("General Provisions of the Regulations Applying to the Award of Doctorates" dated January 12, 1990 (ABl. 1990, p. 658), in the form of the VIIth modification thereof dated September 28, 2010 (Addendum 4.10 to the statutes, p. 3) regarding the award of doctorates, along with the department's special provisions related thereto, apply to the graduate school.



TECHNISCHE  
UNIVERSITÄT  
DARMSTADT

### § 1, Objectives of the graduate school

The Materialium Graduate School's major objective is *improving the general conditions for the award of doctorates*. During their doctoral studies at the graduate school, through their independent researches, doctoral candidates both contribute to scientific progress in the field of materials science and obtain opportunities for advancing their personal careers and acquiring further areas of expertise. Among other things, obtaining a doctorate involves

- development and written formulation of a research plan,
- independent scientific research in areas of current interest to materials science,
- critical assessments of the relevant literature,
- concluding a research project within a specified time period,
- applying solution-oriented methodologies,
- documenting and publishing the results of the research project,
- presenting the results obtained to a specialist audience,
- becoming able to participate in discussions of closely related topics,
- extending one's own professional horizon through regular participation in colloquia, seminars, and group meetings,
- becoming acquainted with the available sources of scientific information and how to make the best use of them,
- acquiring leadership skills in conjunction with counseling other students at problem-solving/laboratory sessions and on their bachelor's/master's thesis work,
- mentoring new members of the Materialium Graduate School,

- managing a scientific project, which might include the involvement of an industrial partner,
- independently working in what will usually be an international team,
- establishing an international network covering academic research and industry,
- participation in national and international conferences, and
- acquisition of social and other skills extending beyond those acquired in conjunction with the doctoral program.



TECHNISCHE  
UNIVERSITÄT  
DARMSTADT

## § 2, Official language

The Materialium Graduate School regards itself as an internationally oriented facility, as evidenced by the multinational character of its student body, staff, and visiting scholars. Since employment of a language understandable by all involved is essential to productive work there, master's-program lecture courses in materials science, events organized by the graduate school, lectures, and colloquia will all be conducted in the English language.

Furthermore, since most scientific articles, both those written by the graduate school's doctoral candidates in the course of earning their doctorates and by others, are written in English, usage of English has become routine in the scientific world. Examinations may be taken in English and/or German.

## § 3, Commencement of work on a doctorate

Work on a doctorate may commence at any time.

## § 4, Requirements for admission

A master's degree or "Diplom" in materials science from the TU-Darmstadt or in a research-oriented, university-level, major field of study, such as chemistry, physics, electrical engineering, mechanical engineering, etc., or equivalent fields, with at least 300 credits according to ECTS and a grade-point average of 2.5 or better shall be required for admission to the Materialium Graduate School. Applicants having master's degrees from institutions other than the TU-Darmstadt shall be in possession of the academic qualifications for acceptance as doctoral candidates, or be tested for compliance therewith.

In other cases, e.g., in the case of applicants who have completed teacher-training programs or applicants with grade-point averages worse than 2.5, the Doctorate Committee shall, upon application by their supervising professor, decide whether success in obtaining a doctorate is to be expected, according to

---

those skills described under the criteria for award of a master's degree in materials science by the TU-Darmstadt.

All other current candidates for doctorates in materials science are advised to join the Materialium Graduate School. Those in compliance with the regulations for the award of doctorates of other departments may apply for associate membership. Those receiving bachelor's degrees with distinction may apply for admission to "fast-track" doctoral programs (cf. § 9 hereof).

## § 5, Organizational structure

Memberships in the graduate school are classified into three categories:

1. **Conditional membership** while awaiting approval of an application for admission to the graduate school
2. **Membership in the graduate school** during work on a doctoral program
3. **Alumna/alumnus** status following award of a doctorate

### 1. Conditional membership

During conditional membership, which falls within the final phase of master's programs, or while awaiting approval of an application for admission to doctoral-candidate status at the graduate school, future doctoral candidates are entitled to all rights and entitlements to usage accruing to regular members, such as participation in lecture courses and department seminars, usage of the library for gaining access to literature in their respective fields of work, utilization of computer pools/computer center, and familiarization with the other facilities available, etc. Graduates of foreign institutions of higher learning shall have obtained formal recognition by the Akademisches Auslandsamt.

### 2. Final acceptance and regular membership

In order to receive membership approval, doctoral candidates shall apply to the dean's office as soon as their dissertation supervisor has agreed to accept their doctoral-research topic, where submission of the following items of documentation will be necessary:

- a completed application form for admission to the Materialium Graduate School (available from the dean's office or online),
- a *curriculum vitae*,
- a certified copy of their secondary-school diploma, listing all grades awarded,
- a certified copy of their bachelor's diploma, and



TECHNISCHE  
UNIVERSITÄT  
DARMSTADT

- 
- a certified copy of their “Dipl.”/master’s diploma (inapplicable to applicants for admission to “fast-track” doctoral programs).

Following approval by the Doctorate Committee, doctoral candidates will become regular members of the Materialium Graduate School. During that research phase, doctoral candidates shall be supervised by a primary supervisor and a secondary supervisor, where their secondary supervisor shall be chosen from either another departmental section or another department. The decisive factors in choosing supervisors shall be subject-matter criteria related to their respective fields of research. Their primary supervisors shall be members of the department where work on their dissertations is to be conducted and financed.

Supervisors shall be obliged to regularly conduct conversations and discussions with those supervised, where primary supervisors shall be obliged to conduct at least one extensive conversation therewith every three months. Such conversations shall involve agreements on objectives and, where necessary, adjustments to objectives that have previously been agreed upon. Secondary supervisors shall inform themselves regarding the progress of work at least every six months and, together with primary supervisors, support those supervised in evaluating the results of work obtained to date and adjusting the objectives pursued by individual doctoral candidates to agree with the current status.

Advanced doctoral candidates and postdoctoral fellows shall be assigned permanent counselors. The graduate school also operates a mentoring program, under which, in parallel with their practical work, newcomers will have access to advanced doctoral candidates, who shall assist them and advise them on routine matters, the resolution of any uncertainties that may arise, and their choices of lecture courses during the initial year of their doctoral candidacies. Conversely, every advanced doctoral candidate shall be entitled to counsel and guide a younger doctoral candidate, thereby gaining experience as a counselor and guide. Participation in teaching provides similar opportunities. Doctoral candidates are obliged to lead problem-solving sessions, seminars, and laboratory sessions attended by younger students in conjunction with B.Sc./M.Sc.-programs in materials science. During their research phases, doctoral candidates shall attend at least two associated lecture courses, which may also be summer schools or joint experimental courses. Such should usually intensify their knowledge of areas that are closely related to the topic of their doctoral dissertation, but have either not been covered, or not been covered in adequate depth, by courses previously taken.



TECHNISCHE  
UNIVERSITÄT  
DARMSTADT

---

Doctoral candidates shall attend working-group seminars related to their respective areas of specialization, where they will learn how scientific lectures and discussions are conducted. They shall also participate in a doctoral-candidate seminar, where interdisciplinary matters are discussed and no professors are present. They are also entitled to participate in other departmental colloquia and seminars, as well as various major research initiatives. They may also attend regularly scheduled events related to materials science as a profession.

The graduate school holds semiannual, in-house, evening, poster sessions, at each of which half of the doctoral candidates shall alternately present their current work and methods. Members of the other half will thus obtain insights into current work in the various areas of specialization, as well as notices of similar events scheduled by neighboring departments in order that interdisciplinarity at the TU-Darmstadt will be promoted and doctoral candidates will have the opportunity to enter into discussions with specialists in closely related areas who might be working on very similar topics and to view their own research topics from a somewhat different angle. Innovative ideas of value to their own work might well arise from such contacts.

Since exchanges of information with other researchers play very important roles in the sciences, doctoral candidates' supervisors are obliged to see to it that the former actively participate in at least one national and one international conference, at which, provided that they have results of interest to report, they present a lecture or a poster.

Undertaking foreign sojourns lasting three to six months is recommended, and supervisors shall expressly encourage doctoral candidates to undertake such. Although renowned foreign universities are the preferred choices here, sojourns at German universities, research institutes, or at industrial partners shall also be allowed. The Materials Science subdepartment maintains contacts with a number of domestic and foreign universities and will provide assistance in choosing a university for an academic exchange.

Publications are a major tool for scientific exchanges and contribute to making the university, its working groups, and doctoral candidates themselves more prominent. Doctoral candidates are thus assigned the task of documenting the knowledge gained during work on their doctorates in the form of at least one publication authored by themselves, which will allow them to learn how to clearly and concisely express the knowledge they have gained and summarize it



TECHNISCHE  
UNIVERSITÄT  
DARMSTADT

---

in an organized manner. Senior authorship of two publications in high-ranking, refereed, international journals shall be the minimum requirement.

Preparation of a dissertation, in which doctoral candidates present the scientific background of their work and document both the work they have conducted and the results obtained therefrom, represents a major part of doctoral programs. The criteria of the TU-Darmstadt's regulations governing the award of doctorates also allow those doctoral candidates to be awarded the degree of Dr. rer. nat. to prepare cumulative dissertations consisting of collections of their published papers.

### 3. Alumni

The Materialium Graduate School offer alumni life-long membership in exchange for a nominal, annual, membership fee (currently € 20.00), whereby participating professors annually conduct an event that brings together current doctoral candidates and alumni. The purpose thereof is both providing doctoral candidates with insights into the work of alumni and establishing contacts among the former and the latter. Conversely, alumni are provided with the opportunity to inform themselves on current research topics, discuss potential collaborations, and sound out potential employees. In addition, the emerging network, including those contacts that already exist, will be amplified by invitations to present lectures on "Materials Science as a Profession," or, on the other hand, company visits/excursions.



TECHNISCHE  
UNIVERSITÄT  
DARMSTADT

### § 6, Approvals to take final examinations/final examinations

Falling at the conclusion of membership in the graduate school are submissions of applications for introduction of procedures for award of a doctorate to the dean of the department's office, submission of a doctoral dissertation, final doctoral examinations, and, ultimately, publication of dissertations, which usually will have been written in English.

Applications for introduction of procedures for award of a doctorate shall be submitted by doctoral candidates via the dean's office, where seven copies of the preliminary versions of doctoral dissertations, which will be forwarded to the examiners, shall be submitted there. The following further items of documentation shall also be submitted:

- a completed, preprinted form entitled "Application for Appointment of an Examination Commission," which is available at the dean's office and on the department's web site,

- a summary of the scientific knowledge gained in conjunction with work on the dissertation, typed single-spaced on a single DIN-A4 sheet, or thereabouts, and
- voluntarily, suggestions regarding the composition of the examination commission, where such shall have been discussed in advance with the supervisors of work on the dissertation, and the stipulations of the regulations on the award of doctorates and/or the special stipulations of the graduate school shall be taken into account.

The examination commission shall render a decision on admission to procedures for award of a doctorate and award of the academic degree, for which an application has been submitted. The appraisal shall be prepared by both supervisors of the doctoral dissertation. An external appraisal shall be required in the case of “with-distinction” assessments.

The public defense of the dissertation shall be conducted within three months of the submission thereof. The examination commission shall consist of a chairperson to be appointed by the dean, the primary and secondary supervisors of the work involved, and at least two further examiners, one of which shall be from another department. In the case of award of a Dr. rer. nat., at least one of the referees must possess the title of “Dr. rer. nat.” In the case of award of a Dr.-Ing., at least one of the referees must possess the title of “Dr.-Ing.” The examinee shall present his/her work to the examination commission and the members of the general public present in a lecture lasting no more than thirty minutes, which shall be concluded by the discussion, whereunder the examiners question the examinee. All other professors of the department are entitled to submit questions to the examinee. Once the examination has been concluded, the examination commission shall adjourn to a closed discussion session and, finally, notify the candidate regarding the grade that has been decided and any restrictions to be imposed on publication of the dissertation.

Once any obstacles to publication of the dissertation have been resolved, the dissertation will be examined by the primary appraiser and approval for publication granted. The work involved shall then be published within one year. Publication of dissertations and submission of the required number of copies shall constitute indispensable requirements for award of a doctorate, and failure to comply with them shall mean that the requirements for award of a doctorate have not been fully met. The Universitäts- und Landesbibliothek (ULB) will provide information on suitable forms of publication and the associated number of copies required.



TECHNISCHE  
UNIVERSITÄT  
DARMSTADT

---

### **§ 7, Collaboration with Ingenium**

The Materialium Graduate School collaborates with Ingenium, the parent organization for promoting the careers of junior scientists at the TU-Darmstadt. Doctoral candidates at the Materialium Graduate School have the opportunity to participate in Ingenium, which involves attendance at interdisciplinary events and professional-advancement courses offered by Ingenium in order to improve their skills. The modules currently offered are “Time and Project Management,” “Teaching Skills,” “Presentation Techniques,” “Academic Publications,” “Submission of Initial Applications for Funding/Acquiring Third-Party Funding,” “Leadership Skills,” “Intercultural Skills,” and “Career Counseling/Employment-Application Training.” The collaboration with Ingenium supports the internal and external networking of the Materialium Graduate School’s doctoral candidates. Ingenium also offers a central meeting point for the Materialium Graduate School’s foreign doctoral candidates and postdoctoral fellows.

### **§ 8, Funding, and other offers of funding from correlated research programs**

Doctoral candidates at the Materialium Graduate School who have been funded in conjunction with (correlated) research projects covering specific research topics have the opportunity to seek funding for further project-related pursuits, such as summer schools and language courses.

### **§ 9, “Fast-track” doctoral programs**

Applicants who demonstrated excellent performance in obtaining their bachelor’s degrees have the opportunity to obtain doctorates under “fast-track” procedures. Graduate schools around the world have established direct routes from a bachelor’s degree to a doctorate. Associated “fast-track” procedures have also been implemented by German graduate schools in conjunction with the German Federal Government’s and German states’ “Excellence” initiative. In this case, access to the doctoral-studies phase is via a trimestral preparatory phase that allows recipients of bachelor’s degrees to obtain the knowledge required for successful conduct of work on a doctoral dissertation and elevate their knowledge levels to those of recipients of master’s degrees or “Dipl.”-degrees. That preparatory phase for a doctoral degree is characterized by a monotonically decreasing content of lecture courses and a monotonically increasing content of research work. A professor of the department, acting as a tutor, is available for counseling “fast-track” participants on their choices of lecture courses from the master’s-degree program. Final admission to the





---

doctoral-studies phase then transpires, following presentation of an accurately specified research plan for work on the doctoral dissertation in both written and oral form, by way of a decision rendered by the Doctorate Committee, where credits corresponding to completion of a master's program, except for submission of a master's thesis, i.e., 90 credits, shall have been obtained. The grade-point average that has been reached at that point shall be better than 2.0.

There then follows the research phase of doctoral studies, at which time, the doctoral student becomes a regular member of the graduate school. Recipients of bachelor's degrees who choose this option are exempted from preparation of a master's thesis. In the event that they discontinue their doctoral studies and leave the graduate school without receiving a doctorate, they may be awarded a master's degree, provided that they prepare and submit a master's thesis.

Darmstadt, April 2, 2012

Prof. Dr. Ralf Riedel,  
Dean, Department of Materials and Geo Sciences