Doctoral Programme
Doctoral School of Mechanical Engineering

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Doctoral School of Mechanical Engineering

where the European Higher Education Area meets the European Research Area

Doctoral candidates are early stage researchers

Doctoral Candidates and their Supervisors are members of the Doctoral Schools.

The Dean of Studies is responsible for all study matters and is supported by the Doctoral School’s coordination team.

Student Council for the doctoral programme

Works Council for academic personnel employed at TU Graz
The Dissertation (doctoral thesis)

In the course of the doctoral studies, a doctoral thesis is to be written, which proves the doctoral candidate's ability to master new scientific problems independently. (§ 5 para 1 CURR)

Qualification:

• A graduate of the Doctoral Programme of Technical Sciences of Graz University of Technology has advanced and perfected the ability to formalise problems in the engineering and natural sciences and to develop research-guided analyses and solutions.

• The graduate is capable of performing high-level scientific work independently.

• The graduate is capable of team work in the field of engineering and scientific research, in both the university and industrial sectors, and can assume coordinating and leading functions.  

(§ 1 para 2 CURR)
In the University Act of 2002 (UG), the Austrian legislator established the fundamental guidelines for the Doctoral Thesis (Dissertation). The universities design the doctoral program's curriculum within their autonomy. The Doctoral Programme in Technical Sciences is set by the Senate of the Graz University of Technology (TU Graz), and the coordination teams of the Doctoral School are charged with creating statutes that take subject-specific characteristics into account.
Doctoral Programme

Admission Process

First Year
- Short Presentation of your project in the Doctoral Seminar within the first semester
- Start networking with other doctoral candidates
- Choose a Mentor (CURR 2019 only)
- Progress Report (Fortschrittsbericht)

Second Year
- First publications
- First conferences
- From 2nd year on: Final Presentation in the Doctoral Seminar
- Try to complete your curriculum
- Progress Report (Fortschrittsbericht)

Final Year
- Two month before thesis submission: Select reviewers (assessors) and send first version of the thesis to them for pre-review
- Submit the final version of your thesis. The review process and the grading of the thesis then starts.

Rigorosum (Thesis defense)

Supervisor's Institute
Registrar's Office
Doctoral Management Tool “My Doctoral Project”
(Intranet TU Graz, please log in first)

Form sheet download from TU4U
(Doctoral degree programmes – Dean’s Office for Mechanical Engineering and Economic Sciences, Intranet TU Graz, please log in first)
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Important information will be sent to your student e-mail account @student.tugraz.at. Please forward this student mail-account to your business mail-account!
Doctoral candidates are entitled to choose a supervisor. He or she is also entitled to propose the topic or to choose the topic from a number of proposals. A change of supervisor shall be permissible up until the doctoral thesis is submitted.

One task of the supervisor is to guide the doctoral candidate towards independent scientific work. An exchange at regular intervals between the doctoral candidate and the supervisor, based on progress reports provided by the doctoral candidate shall be agreed upon. The supervisor has to be a TU Graz faculty member with a venia docendi (licence to teach at TU Graz; Lehrbefugnis). (§ 4 CURR, para 7 STAT)

Venia (Docendi), [Latin, venia = favour, permission, license; docere, to teach, to instruct]: license to teach at a university. In Austria, a license to teach is granted by appointment as a professor at this university or by a habilitation at this university by a decision of the rectorate.
Signing the Educational (Training) Agreement

- **Upon acceptance of a doctoral candidate, an educational agreement is concluded and signed** by the doctoral candidate, the supervisor, and the Dean of Studies.

- **The supervisor confirms**, according to the supervisor’s expertise in the subject that the doctoral project can be accomplished within the envisaged time frame.

- **The doctoral candidate agrees to observe the guidelines of Graz University of Technology ensuring good scientific practice**. § 4 CURR

- Minimum period of the programme: **3 years** (§ 54 UG)

Form sheet download from **TU4U**
Choosing the Curricular Workload

14 semester course hours (SWS) of instructional classes in three modules

When starting your doctoral program, the instructional classes portfolio (Curricular workload) has to be approved by the Dean of Studies.

**Module 1: “Subject-specific basic courses”, 8 semester course hours (SCH);**
Subject-specific basic courses are selected by the doctoral candidate in close consultation with his/her supervisor from the portfolio offered by Graz University of Technology. The DSM recommends courses from § 5a of the master’s curriculum in Mechanical Engineering (electives). Courses completed in the doctoral candidate master’s programme are not eligible as subject-specific basic courses. You are strongly discouraged to choose all courses from the supervisor’s institute!

**Module 2: “Scientific Methods and Communication”, 4 semester course hours, 2 of which must be the doctoral seminar;**
aim: to provide the theoretical knowledge and practical skills for developing results in research with scientific methods, and to present and defend these results. Please register in winter AND summer semester (each semester is only one SCH).

**Module 3: An exclusive tutorial (Privatissimum), 2 semester course hours.**
The exclusive tutorial is an opportunity for one-to-one engagement with the candidate’s work offered by the supervisor and entails the study and discussion of presented concepts, preliminary results, formulations etc. and a concrete feedback from the supervisor.
Choosing the Curricular Workload

Form sheet download from TU4U
(Doctoral degree programmes – Dean’s Office for Mechanical Engineering and Economic Sciences, Intranet TU Graz, please log in first)

Module 1: Courses from other subject areas or other universities may be chosen upon application. Please choose these courses in the Curricular Workload form when you start your doctoral programme. (The supervisor confirms, the dean of studies approves.) § 6 para 2 CURR

Module 2: Courses often chosen by doctoral candidates can be found in para 12 STAT.

Please fill out the form sheet immediately when you start your doctoral programme and mail it to the Dean's office!

During your studies your classes portfolio (Curricular workload) can be changed upon application. Please apply together with your supervisor at the dean’s office. An explanatory statement why this change is required must be given!
Mentorship

- Doctoral Candidates are entitled to call upon one or more persons to consult and accompany the doctoral project. (§ 4 para 5 CURR)

- The Doctoral School of Mechanical Engineering agrees upon the good scientific practice to suggest experienced scientists as mentors. (para 7 STAT)

- Especially in industry-related projects, doctoral candidates must take into account confidentiality and conflicts of interest when making their selection. (para 7 STAT)
In the doctoral seminar, progress and results of the doctoral projects at the Doctoral School of Mechanical Engineering are presented. The seminar is held in four four-hour blocks each semester. In these sessions, doctoral candidates from their second year on present their work in a 20 min presentation. All doctoral candidates in the first semester of their studies briefly introduce themselves and their work (5 min).

For your presentations online registration only!
The Doctoral Seminar at DSM

5 minutes presentation:
Where are you from, what did you study?
What is the objective of your scientific work?
Will you work experimentally or numerically?
Who is your supervisor? At which institute (company) are you employed? In which lab will you carry out your research? Financing? Are there any research partners?

20 minutes presentation (+ 10 min discussion):
At first, mention your supervisor, your supervising institute, your employer (if not identical) and the project funding.
What can you expect from the audience?
deepened mathematical knowledge; deepened scientific knowledge (physics, chemistry, informatics, diagnostic techniques); basic knowledge on design and construction, mechanics, dynamics, fluid mechanics, thermodynamics, and materials science; basic principles of business administration.

The presentations must be in English and should be easy to follow so that all members of the Doctoral School are properly informed about your scientific task. A scientific discussion on the topic shall be triggered.
The Doctoral Seminar at DSM

Please download your presentation to the laptop placed at the console before the seminar starts.

Please test the presentation in case you have animated transparencies. Whenever special animations are required, please plug in and test your personal laptop before the seminar starts!

A Feedback Form is distributed to all participants of the seminar in the classroom. The individual result on his or her 20 minutes presentation of this feedback can be viewed by the speaker only.

Some statistics averaged over 8 years

<table>
<thead>
<tr>
<th>Grading 1 to 5</th>
<th>Content</th>
<th>Arrangement</th>
<th>Language</th>
<th>Time</th>
<th>Presentation</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.7 ± 0.3</td>
<td>1.6 ± 0.3</td>
<td>1.7 ± 0.4</td>
<td>1.8 ± 0.3</td>
<td>1.7 ± 0.2</td>
<td>1.4 ± 0.4</td>
</tr>
</tbody>
</table>

Best 1

Worst 4.1

Best 1

Content Arrangement Language Time Presentation Questions
Publications

- The Doctoral School of Mechanical Engineering encourage doctoral candidates to **publish at least two reviewed articles in international journals or at international conferences prior to pre-selection of the reviewers.** Articles must be submitted, accepted for publication or published. (para 9 STAT)

**Publication,** [Latin, publicare = to make public]: A valid scientific publication usually is characterized by a DOI (digital object identifier), or an ISBN (international standard book number), or an ISSN (international standard serial number).

**Peer-reviewed publication:** To be considered a peer-reviewed publication, there must generally be two, mostly anonymous reports, based on which the editor accepts, rejects, or returns the paper for revision before a possible acceptance. This peer-review process ensures the quality of scientific work before it is published.

Average number of publications per doctoral candidate at DSM. 2018-2022, 2008-2014, and 2014-2018 evaluation periods are compared.

<table>
<thead>
<tr>
<th>Period</th>
<th>Total Publications</th>
<th>Reviewed Publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018 - 2022</td>
<td>6,3</td>
<td>4,1</td>
</tr>
<tr>
<td>2014 - 2018</td>
<td>7,3</td>
<td>4,4</td>
</tr>
<tr>
<td>2008 - 2014</td>
<td>6,1</td>
<td>2,6</td>
</tr>
</tbody>
</table>
Throughout Europe, young scientists on their way to a doctorate must pre-publish important partial results in international journals before submitting their doctoral thesis (dissertation). On the one hand, such an approach increases the probability of obtaining funding for one's scientific work quickly after the Rigorosum (final examination; defense); on the other hand, it also increases the international visibility of our TU Graz. Since these publications are pre-publications for the dissertation, many of our doctoral candidates ask themselves how it is now possible to include these works in their dissertations.
Coming to an end – pre-selection of reviewers

- **The reviewers (with venia) should be pre-selected 2 months before submission of the doctoral thesis** at the latest. From that time on, all the referees are to be provided with a preliminary version of the doctoral thesis (**pre-assessment phase**). (§ 5 para 3 CURR)

- **Completed parts of the thesis shall be published before the selection of reviewers.** If proof of such publications cannot be provided at the time that the assessors are appointed, at least three assessors (**reviewers**) shall be appointed, of which at least one must be from outside of TU Graz. (§ 5 para 6 CURR)
Coming to an end – the review process

- When the thesis is finally submitted to the dean’s office, the dean of studies will forward the doctoral thesis to the assessors (with venia), who must assess the doctoral thesis within four months.
- It is recommended to involve at least one professor from another university.

In 2018 – 2022, the DSM second reviewers were from the following regions:
Coming to an end – the review process

- Upon submission of the doctoral thesis, the Dean of Studies initiates the final assessment (grading!) by the selected referees. The doctoral school provides a guideline for the thesis assessment.
Thesis defense at DSM

What do I need to organize my defense?

1) Positive assessment of the thesis
2) Successful completion of the courses
3) The yearly progress reports

Instructions how to file your thesis and the form sheet download is found at [TU4U](https://www.tugraz.at) (Doctoral degree programmes – Dean’s Office for Mechanical Engineering and Economic Sciences, Intranet TU Graz, please log in first)
Rigorosum – The thesis defense at DSM

- As a rule, the board of examiners (committee) for the thesis defence consists of the Dean of Studies for Mechanical Engineering (chairperson), the supervisor, and additional university lecturers with venia who may, but do not have to be, the assessors of the doctoral thesis. Such a committee must consist of at least three persons.

- The thesis defence starts with the doctoral candidate presenting his/her research work based on the content of his/her doctoral thesis, e.g. the scientific problem formulation, the selected research methodology, the areas of emphasis and the main results. After the presentation the candidate answers questions on the doctoral thesis and its presentation, as well as on closely related subject areas. The thesis defence is open to the public, but only members of the examination board are authorised to ask questions.

- As a recommended guideline, a presentation time of 30 to 45 minutes is considered to be sufficient. The discussion part should be approx. 20 minutes questions per examiner. The discussion part has the character of a defence of the doctoral thesis consisting of questions on the subject of the doctoral thesis and the related subject area. (Appendix to § 7 CURR)
An allegory of mechanical engineering or mechanics is depicted on the Aula's ceiling. She is holding a gear wheel and a centrifugal governor. In 1901, legislation granting the Technische Hochschule Graz the ability to confer doctorates was passed concurrently across the entire monarchy for all Technical Universities. At what is now the Graz University of Technology, Hans Löschner received the first engineering sciences doctorate ever granted by the monarchy in 1901. The two wall-mounted panels to the left and right of the allegory, which hang on the stairwell outside the Aula, depict the strategic partners that TU Graz has (accessed 2023).