

PhD at ISEC

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Before the Admission

- You find a PhD supervisor at ISEC and agree on basic research questions for the PhD
- The supervisor signs a **supervision confirmation letter**

Start of the PhD

- You receive an **employment contract** with ISEC or an associated organization (e.g., Know Center, SIC) - typically for 1 year in the first step
- You register as a **PhD student** and can start taking courses for your doctoral studies

After 1 Year: **PhD Proposal**

- You submit a **proposal document** (2 weeks before your proposal defense), showing that you have demonstrated all skills necessary for conducting a PhD
- You **present and defend** your Proposal publicly before your **advisory committee**, which you select together with your supervisor
- If successful, you and your supervisor sign the **Educational Agreement** and your employment contract is extended

After Every Year: **Yearly Reports**

- Every year you write an **annual PhD Progress Report** by October 1
- Between October and December, you meet with your supervisor to discuss the report, typically in the annual **Staff Appraisal Meeting** (Mitarbeiter*innengespräch)
- In case of disagreement on the PhD progress, you meet with your advisory committee

After 1.5 to 3 Years: **PhD Candidacy**

- Apply to your committee when you have peer-reviewed content for **3 thesis chapters**
- If successful, you evolve from PhD Student to **PhD Candidate**

After 3 to 5 Years: **PhD Defense and Thesis**

- You write your **doctoral thesis** (Dissertation) and **defend** it before a PhD committee
- You are then a **PostDoc**. In agreement with your group leader, you can choose to stay at ISEC for a total of up to 6 years, counting from your first day as a PhD Student

Document Scope and Introduction

Doing a PhD is a journey of personal development while pushing science forward. Although this is a very individual journey, we want to give it some structure and align it with the regulations of the university and the doctoral school. In this document, we describe our process, including our expectations.

The expectations on PhD graduates is also clearly expressed in §1 of the curriculum of the PhD programme: *“The graduate is capable of performing high-level scientific work independently. The graduate is capable of teamwork in the field of engineering and scientific research, in both the university and industrial sectors, and can assume coordinating and leading functions. The graduate has a broad basis and a consolidated field of specialization and can thus advance and innovatively apply scientific knowledge in various fields of application”*. While this is a clear goal, this document defines the process towards achieving this goal at the ISEC as well as concrete requirements and expectations.

The expectations also include concrete numbers (e.g., for the number of publications). We provide these numbers as orientation. However, clearly a PhD cannot be reduced to plain numbers. A PhD is a process where you gain broad and deep knowledge to do independent research in your field and you learn how to show that your research has merit. Hence, the central focus is on the research and its communication to the scientific community in order to spread the knowledge and to receive feedback. The metrics then follow automatically. It is definitely possible that a PhD with the minimum number of papers as set out by the doctoral school is as impactful as a PhD with twice as many papers. It is the actual content of the PhD that matters. It is in the realm of your PhD supervisor to help you to find the best approach for conducting and communicating your work in your specific field of research. This document provides general guidelines, but does not replace individual supervision.

Everything that is described in this document is there to help you structure your PhD and to support you in doing a successful PhD. In particular, the milestones in the process, i.e., the PhD proposal defense and later the PhD defense, are better understood as a chance to showcase and present your work rather than as exam situations. We always look very much forward to those presentations and also see them as outreach opportunities.

Overall, the document is structured chronologically. It starts with the first milestones and ends with the process of handing in your PhD thesis.

Your PhD Proposal

You submit your PhD proposal **within 12 months** after you start your employment as a PhD student at ISEC. The proposal consists of a document, presentation, and defense before an advisory committee. For files and templates, see:

<https://extgit.isec.tugraz.at/isec/phd-at-isec>.

Prerequisites for the Proposal

In the first year, you are expected to **demonstrate all skills necessary for conducting a PhD** according to your supervisor's requirements. You should typically have **worked partly independently** on your own project topic defined together with the supervisor. This includes **writing** (e.g., submitting a paper) and **speaking** (e.g., seminar talk about ongoing work) about your results. A typical way of achieving the requirements for the proposal is submitting a paper to a conference or journal. We expect **at least one mature paper draft or submitted/accepted paper** when you submit the proposal. Your supervisor will tell you in more detail what they expect from a PhD student in their group during the first year. The PhD proposal is usually **in the last month of the first year**.

Advisory Committee

Your advisory committee will advise you throughout your PhD where needed to ensure you reach your goals. The advisory committee consists at least of **3 professors** (assistant / associate / full), including your supervisor and at most one professor who is not at ISEC. You choose your advisory committee when you submit your proposal. You can choose to add additional mentors (see Curriculum § 4 (5)).

Submission

You submit the following to phd.isec@tugraz.at:

- A list of **3 advisory committee** members
- A **date** for the proposal defense, agreed with the committee
- A short **proposal document** (about 4 pages) containing
 - An introduction to the research field and main research questions of your PhD
 - A summary of your research work of the first year
 - Concrete next steps and a mid-term outlook on the PhD
 - State the courses (typically 2-3) that you plan to take as part of the PhD
 - An optional appendix summarizing contributions and activities related to the PhD, such as teaching, student supervision, project work, ...
- A draft **Educational Agreement** with working title and abstract (research field, research questions, methodology) for your thesis project

Presentation & Defense

You give a public presentation of 30 minutes covering the work of the first year and your planned thesis topic, followed by a 30-minute question session by the advisory committee.

After the defense, the committee members will retreat to decide on the result of the defense based on the skills demonstrated as a PhD student, report, presentation, and answers. They will inform you about their decision and may give additional recommendations and feedback.

Possible Outcomes

If the advisory committee decides your proposal was successful, your working contract is extended and you receive the signed Educational Agreement from your supervisor. Congratulations! By accepting the proposal and issuing the Educational Agreement, your supervisor confirms the expectation that you bring in the prerequisites to conduct a PhD and that you can work together well. If the committee sees room for improvement, you can repeat the proposal once within 6 months to address feedback. In the unexpected event that the proposal is rejected, you cannot continue your PhD at ISEC and your employment ends (see Curriculum § 4 (7)).

Educational Agreement

The Educational Agreement is specified in the Curriculum (§ 4 (1)) and finalizes your acceptance as a doctoral student. It contains a brief description and working title of the proposed doctoral project and is uploaded in TUGRAZonline (login as student - “My doctoral project” / “Mein Doktorat” - “Phase 1 Educational Agreement” / “Ausbildungsvereinbarung”). You can find the form on:

<https://extgit.isec.tugraz.at/isec/phd-at-isec> or

<https://tu4u.tugraz.at/en/students/forms-downloads/>

Yearly Reports

The curriculum requires that you complete yearly reports (§ 4 (4)). At ISEC, these are typically combined with the yearly **Staff Appraisal Meeting** (“Mitarbeiter*innengespräch”) with your team leader and supervisor, which takes place between October and December. The report covers the period of one academic year, from **1 October to 30 September** in the following year.

Get the template from <https://extgit.isec.tugraz.at/isec/phd-at-isec> and fill in the details. Send the full report to your supervisor **by 1 October**. Then, in case you already have a signed educational agreement, you also upload the research summary part (see template) in TUGRAZonline (TUGRAZonline student view: “My doctoral project”/“Mein Doktorat” > “Phase 2” > “Complete progress report” / “Fortschrittsbericht ausfüllen”), where your supervisor comments on your report in written form (menu “Doctoral management” / “Doktoratsmanagement”).

In case you and your supervisor agree that there is sufficient progress towards the PhD, all is fine. In case there is insufficient progress to the PhD or disagreement on the progress, clear goals and a timeframe for completion are formulated in alignment with your advisory committee. In case of failure to reach these goals, the employment ends. The PhD student and the supervisor can then agree if and under what conditions a PhD can be continued without employment.

PhD Candidacy

About half-way through your PhD, so after at least 1.5 years and typically before 3 years, your role switches from PhD student to PhD candidate. With this change of roles, your responsibilities and expectations also change: You are now expected to largely independently carry out research and increasingly help others with their research. When you and your supervisor consider you ready for this step, you can apply for the PhD candidacy. A formal requirement for submission is that your research work has yielded peer-reviewed content for **3 chapters** of a PhD thesis (where 1 chapter typically corresponds to the **main contribution of 1 paper**).

In order to submit your application to PhD candidacy, send an email to phd.isec@tugraz.at. After confirmation by the advisory committee, you advance from a PhD Student to a **PhD Candidate**. This becomes effective with the first day of the second month after having sent the email and fulfilling all requirements.

If you do not reach the status of a PhD candidate within 3 years of starting your PhD, you need to send a plan to the advisory committee including a detailed timeline for the remaining steps towards completion of the PhD candidacy and an outlook on completing the PhD. The purpose of this plan is to provide a basis to determine if there are any issues that need to be addressed by the student or the advisor.

Publications and Doctoral Thesis

You complete your doctoral studies typically **within 3 to 5 years**. Three years is the formal minimum time. According to the Curriculum § 4 (6): “Failure to submit a doctoral thesis within 5 years after admission to the doctoral programme requires justification in the respective report and a comment from the supervisor in the yearly report.” - in that case, the thesis must still be completed within 6 years.

The statutes of the doctoral school formally require a minimum of 3 peer-reviewed articles in international journals or conferences to complete the doctoral studies. Overall, it is the quality of the scientific contributions that determines the quality of the thesis. It is therefore important to emphasize that fewer excellent high-impact papers are considered more desirable than more mediocre papers. Receiving the best grade on the PhD generally requires having a full paper as main author at one of the top conferences of the field.

A dissertation at ISEC is typically based on **about 5 peer-reviewed publications**. The decision on when to submit a thesis is taken jointly between the PhD student and the supervisor based on the overall scientific contributions and the conventions of the field of research. Typically, one of the authors of a publication is the main author and this author includes this publication in the PhD thesis. A scientific contribution can only be part of one PhD thesis and cannot be claimed by multiple theses. In extraordinary cases of

publications with joint first-authorship (e.g., multidisciplinary works) and with substantial well-separable, self-contained scientific contributions, these separate contributions can become parts of two PhD theses, in agreement with the corresponding supervisors.

During a typical PhD, there is close collaboration with other researchers. Besides own publications as the main author, a PhD student typically also contributes as a co-author to several publications that will be part of another PhD student's thesis.

According to the statutes of the doctoral school, a **cumulative dissertation (Manteldissertation)** is possible if the student and advisor agree on this format and certain conditions detailed in the statutes are satisfied - please check the current [statutes document](#). In particular, a cumulative dissertation needs to include a paper published at an A* conference (CORE ranking) and, in the case of alphabetic author lists, a statement from all co-authors confirming that the doctoral student was the main author.

Courses and Doctoral School

When you start your PhD student position, you register for the Doctoral Programme in Technical Sciences (Dr. techn.) and belong to the Doctoral School of Computer Science.

You need to complete courses amounting to a **total of 14 SSt** (semester course hours, aka Semesterwochenstunden SSt - not ECTS!), divided into

- 6-8 SSt subject-specific basic courses (typically those offered by the institutes for the master's degree programmes, but no courses you already took for your MSc),
- 4-6 SSt for Scientific Methods and Communication, including the course "700.011 Scientific Methods" (2SSt), doctoral seminar (2 x 1SSt), and soft skills courses
- 2 SSt for the Privatissimum with your supervisor

Check out [ISEC's courses](#). We recommend that you complete most courses in the first half of your PhD studies. Agree on a course plan with your supervisor for the proposal document.

You need to register ("inscribieren") at TU Graz for the doctoral school: Check the [CS&BME PhD info](#), [TU Graz PhD admission requirements](#), and [TU Graz admission steps](#).

Further Information

- [Doctoral School of Computer Science - TU Graz](#)
- [Statutes of the Doctoral School of Computer Science](#)
- [Curriculum for the Doctoral Programme in Technical Sciences as of 1 October 2020](#)