Direct Doctorate
Computer Science
Study Guide

Doctor of Science ETH
Direct Doctorate in Computer Science Study Guide

Programme Regulations 2020
RSETHZ 324.1.1600.12

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Table of Contents

1 Introduction and General Information

1.1 Target Audience and Advantages 6
1.2 About this Study Guide 6
    1.2.1 Study Guide of the Master’s Programme 6
    1.2.2 Guidelines for Doctoral Studies 7
1.3 Contacts 7

2 Direct Doctorate Programme

2.1 Programme Overview 8
    2.1.1 Tutor and Supervisors 8
    2.1.2 Programme Requirements 9
2.2 First Year 10
    2.2.1 First Year: Minimum Requirements 10
2.3 Second Year 11
    2.3.1 Practical Work and Research in Computer Science 11
    2.3.2 Second Year: Minimum Requirements 12
    2.3.3 Master’s Thesis 13
2.4 Doctoral Studies 13
    2.4.1 Research Plan 13
    2.4.2 Doctoral Thesis 14
    2.4.3 Doctoral Degree: Minimum Requirements 14

3 Administrative Matters

3.1 Enrolment and Degrees 15
    3.1.1 Master’s Degree 15
    3.1.2 Doctoral Degree 15
3.2 Finances 16
1 Introduction and General Information

1.1 Target Audience and Advantages

The direct doctorate programme in computer science is intended for excellent students with a Bachelor’s degree in computer science or a related field, who are aiming at a career in research. It enables them to explore a broad range of areas in computer science and to become acquainted with the different research groups in the department before commencing their doctoral thesis.

Furthermore, admitted direct doctorate students benefit from a broad network at the department and are well-positioned to be offered a doctoral position in the Department of Computer Science and financial support throughout their studies, provided that they meet all the requirements of the first two years of the direct doctorate programme.

1.2 About this Study Guide

This study guide contains important information for successful completion of the programme. Every student should read it carefully, since it is the student’s responsibility to fulfil the requirements of the programme at all times.

1.2.1 Study Guide of the Master’s Programme

The study guide of the Master’s programme in computer science, regulations 2020, is an essential part of this study guide, as direct doctorate students will also obtain a Master’s degree in Computer Science. Therefore, all requirements for Master’s students also apply to direct doctorate students. The study guide for the Master’s programme in computer science can be found here.
1.2.2 Guidelines for Doctoral Studies

The detailed guidelines for doctoral studies at the Department of Computer Science are also an essential part of this study guide, since direct doctorate students eventually gain a doctoral degree. Consequently, all requirements for doctoral students also apply to direct doctorate students. The guidelines can be found here.

1.3 Contacts

Do not hesitate to approach one of the contacts below for further advice. All contact details can be found online.

- The Director of Studies is responsible for the degree programmes, examination regulations and the validation of examination results. All requests addressed to the Director of Studies must be submitted to the Studies Administration Office in written form.
- For questions on study planning or other content-related concerns, students may contact the Study Coordinator.
- The Studies Administration Office can help students with most issues, in particular with administrative affairs. In any case, it will be able to refer them to the right person.
2 Direct Doctorate Programme

2.1 Programme Overview

The programme is designed to be completed within six years – a maximum of two years for the Master’s studies, followed by four years to conduct research and write the doctoral thesis in one of the research areas of the department.

The direct doctorate in computer science is a full-time programme. Students obtain 120 ECTS for their Master’s studies and an additional 12 ECTS for their doctoral studies.

2.1.1 Tutor and Supervisors

In addition to the contacts mentioned in chapter 1.3, the following people support students in successfully completing the direct doctorate programme. Note that detailed descriptions of the topics mentioned are provided below in the respective chapters.

<table>
<thead>
<tr>
<th>Role</th>
<th>Characteristics</th>
<th>Programme</th>
<th>Document</th>
<th>Deadline for appointment</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutor</td>
<td>D-INFK faculty</td>
<td>MSc</td>
<td></td>
<td>end of first semester</td>
<td>assigned to students automatically</td>
</tr>
<tr>
<td>Master’s thesis supervisor</td>
<td>D-INFK faculty</td>
<td>MSc</td>
<td>Master’s thesis</td>
<td>start of fourth semester</td>
<td>talk to the professor (and optionally their research group)</td>
</tr>
<tr>
<td>Doctoral supervisor</td>
<td>D-INFK faculty</td>
<td>PhD</td>
<td>Doctoral thesis</td>
<td>start of fifth semester</td>
<td>talk to the professor (and optionally their research group)</td>
</tr>
</tbody>
</table>

We strongly advise students to identify potential doctoral supervisors as early as possible and to engage with their research groups in order to evaluate whether there is a mutual interest in working together. The Master’s thesis and doctoral supervisor are often the same person, but not necessarily.
2.1.2 Programme Requirements

The direct doctorate programme has special requirements, which are explained in the following chapters (see First Year: Minimum Requirements and Second Year: Minimum Requirements). Students who fail any of these minimum requirements consequently fail the direct doctorate programme. If a student fails the direct doctorate programme due only to the direct doctorate minimum requirements, but not due to Master’s programme requirements, they lose their scholarship but may complete their Master’s studies. In addition, a student is eligible to reapply for admission to the doctoral programme after having completed the Master’s programme.
2.2 First Year

During the first year of study, students are concerned primarily with their Master's course and exam preparation. Depending on the course, examinations take place either in the two weeks before and after the end of the semester (end of semester exams) or in the exam sessions in the winter and summer break (session exams).

2.2.1 First Year: Minimum Requirements

The following factors are critical for successful completion of the first year. Note that the boxes outlined in red are minimum requirements, which, if not reached, will lead to exclusion from the programme.

- Students must achieve a minimum GPA of 5.0 per semester (see below)
- A minimum of 20 ECTS must be obtained in each individual semester
- At least 16 credits must be earned in the Inter Focus Courses by the end of the second semester
Students who fail any of these factors consequently fail the direct doctorate programme. In the GPA calculation, all semester grades, including failed exams, are weighted according to their ECTS points. No-show-exams (unexcused absences) are valued as a grade 1. Pass/fail grades are not taken into consideration.

2.3 Second Year

During their second year of study, students are concerned primarily with completing the required courses and conducting their Master’s thesis.

2.3.1 Practical Work and Research in Computer Science

The programme includes a course category called Practical Work, which fosters the student’s ability to solve scientific problems by applying acquired knowledge and social competencies. Practical Work is either a semester project or a lab course, conducted under the supervision of a professor in the Department of Computer Science or an associated professor. Practical Work can be conducted as a group work, provided that each student’s performance is assessed individually. Students are asked to refer to the websites of the individual research groups or talk to research groups in the preferred area in order to find a suitable project. Further details can be found here.

Students are strongly advised to choose a research-oriented semester project as their Practical Work. To maximise their exposure to different groups (and to increase the likelihood of finding a doctoral supervisor), it is recommended that the semester project and Master’s thesis are carried out in different groups.

Direct doctorate students may choose Research in Computer Science as an elective course, which allows them to work on another research project. Practical Work and Research in Computer Science can also be combined into one larger research project. Note, however, that both units have their own requirements that must be met in order to make use of this combination. Further information can be found in the course catalogue.
2.3.2 Second Year: Minimum Requirements

The following factors are critical for successful completion of the second year. Note that the boxes outlined in red are minimum requirements, which, if not reached, will lead to exclusion from the programme.

- Students must achieve a minimum GPA of 5.0 per semester (see GPA calculation)
- A minimum of 20 ECTS must be obtained in the third semester
- Students must meet all Master’s programme requirements by the end of the second year

Students who fail any of these factors will consequently fail the direct doctorate programme.
2.3.3 Master’s Thesis

The Master’s thesis demonstrates that a student is able to use the knowledge and skills acquired during the Master’s studies to solve a complex computer science problem. A successful thesis gains 30 ECTS. The necessary requirements for starting the Master’s thesis can be found in the MSc Study Guide. Note that for direct doctorate students, the following rules apply in addition:
- The thesis must be completed by no later than the end of the first two years of the direct doctorate studies. Students should start their Master’s thesis no later than the third week of the corresponding semester.

2.4 Doctoral Studies

After graduation from the Master’s programme and approval of their research plan (see Research Plan), students begin to focus exclusively on their doctoral thesis. The same rules and procedures apply as for all other doctoral students in the department. Further details can be found in the guidelines above (see Guidelines for Doctoral Studies).

2.4.1 Research Plan

Writing a research plan helps students to structure and plan their research work and thesis. It further helps them to gain valuable experience in writing research proposals. The guidelines on how to structure the research plan and its expected content can be found here. Note that these guidelines are general and the minimum requirements; some research groups have their own guidelines and might require more content. Furthermore, direct doctorate students should also designate the co-examiner of their doctoral thesis in the research plan. Students must present their research plan to their doctoral supervisor and their co-examiner. After their approval, the research plan will be forwarded to the doctoral committee for approval.
2.4.2 **Doctoral Thesis**

The doctoral studies conclude with the doctoral thesis, which is subsequently defended during the doctoral examination. Before beginning the thesis, the student’s doctoral supervisor must be registered at the Doctoral Administration Office.

2.4.3 **Doctoral Degree: Minimum Requirements**

The following factors are critical in the successful completion of a doctoral degree:

- Doctoral students must earn at least 12 credits, whereby at least four credits must be acquired outside their research field.
- Doctoral students must submit their research plan by the end of the third year after the start of the direct doctorate programme.
- The doctoral examination must be undertaken within six years of starting the direct doctorate programme.
3 Administrative Matters

The following sections address administrative concerns. If students have questions related to enrolment, they may refer to the Studies Administration Office.

3.1 Enrolment and Degrees

Students are enrolled as doctoral students throughout the entire programme. In addition, they are enrolled in the Master’s programme in Computer Science during the first two years.

<table>
<thead>
<tr>
<th>MSc enrolment</th>
<th>Doctoral enrolment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>2nd year</td>
</tr>
</tbody>
</table>

As a result, students have two enrolments in myStudies during their first two years.

3.1.1 Master’s Degree

After the 120 ECTS credit requirements for all Master’s courses have been fulfilled, students may file the Master’s diploma degree request. Students who fail the direct doctorate programme due to direct doctorate minimum requirements only, and not due to the Master’s programme requirements, may still proceed towards obtaining a Master’s degree, but without a scholarship (see chapter 3.2).

3.1.2 Doctoral Degree

The doctoral degree at ETH entitles graduates to hold the following academic title:

English: Doctor of Science ETH Zurich (Dr. sc. ETH Zurich)
German: Doktor bzw. Doktorin der Wissenschaften ETH Zürich (Dr. sc. ETH Zürich)
3.2 Finances

Throughout the six years of the programme, students are financially supported by the scholarship and afterwards by a salary. The scholarship during the first two years of the programme covers all living costs. In addition, tuition fees do not apply to direct doctorate students. From the third year, students are employed with a competitive salary. The direct doctorate programme is a full-time programme. Therefore, students are strongly advised not to work during their studies.

<table>
<thead>
<tr>
<th>Scholarship</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>2nd year</td>
</tr>
<tr>
<td>3rd year</td>
<td>4th year</td>
</tr>
<tr>
<td>5th year</td>
<td>6th year</td>
</tr>
</tbody>
</table>

A failure of the direct doctorate programme leads to the loss of financial support by ETH. In this case, students must arrange their financial support privately.
Important addresses and contacts

**Direct Doctorate in Computer Science**
www.inf.ethz.ch/direct-doctorate-cs

**Course Catalogue**
www.vvz.ethz.ch

**Academic Services**
ETH Zurich, HG Building
Rämistrasse 101
8092 Zurich, Switzerland
kanzlei@rektorat.ethz.ch
www.ethz.ch/students-admin
Office HG F 19
Mo–Fri, 11:00–13:00
Phone +41 (0)44 632 30 00
Mo–Fri, 09:00–11:00, 14:00–16:00

**Department of Computer Science**
ETH Zurich, CAB Building
Universitätstrasse 6
8092 Zurich, Switzerland

**Director of Studies**
Prof. Zhendong Su
directdoctorate@inf.ethz.ch

**Studies Administration Office**
Tony Joller
CAB F 62 / +41 (0)44 632 72 01
directdoctorate@inf.ethz.ch

**Student Exchange**
Dr. Claudia Otto
CAB F 64.1 / +41 (0) 44 633 71 26
mobility@inf.ethz.ch

**VIS**
Association of computer science students
www.vis.ethz.ch

**MoEB**
Committee for Master students without an ETH Bachelor’s degree
CAB E 31 / +41 (0)44 632 72 12
vis@vis.ethz.ch
www.vis.ethz.ch

**Coaching**
Regula Cinelli
HG F 69.1, Rämistrasse 101
regula.cinelli@sts.ethz.ch
www.sts.ethz.ch

**Psychological Counselling Service**
By appointment
+41 (0)44 634 22 80
pbs@ad.uzh.ch
www.pbs.uzh.ch