# Appendix

To the Programme Regulations 2009 of the
Master's Degree Programme in Computer Science

12 July 2010 (Version 1 November 2011)

*Applies to students who commence the degree programme in Autumn Semester 2011 or later. For those entering the programme before Autumn Semester 2011 the stipulations of the previous Appendix apply.*

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*This is an English translation only. The original German version is the legally binding document.*

This appendix sets out the prerequisites for and further details regarding admission to the Master's degree programme in Computer Science. It supplements the stipulations of the Admission Regulations of ETH Zurich and the Directive on Admission to Master's Degree Programmes.

## Contents

# 1 Profile of requirements

*Policy*

For admission to the Master's degree programme in Computer Science (subsequently 'the degree programme') all of the following prerequisites must be satisfied.

## 1.1 Degree qualifications

[1] For admission to the degree programme one of the following is required:

a. a university Bachelor's degree in Computer Science comprising at least 180 ECTS[(1] credits or an equivalent university degree in Computer Science
b. a Bachelor's degree in Computer Science from a Swiss university of applied sciences comprising at least 180 ECTS[(2] credits
c. a university Bachelor's degree comprising at least 180 ECTS credits or an equivalent university degree in a discipline whose content covers the academic prerequisites listed in 1.2. Said disciplines include, in particular (listed alphabetically):
   – Electrical Engineering (and Information Technology)
   – Mechanical Engineering
   – Mathematics
   – Physics

[2] A Bachelor's degree qualifies its holder for admission to an ETH Master's degree programme only if it also qualifies said holder to enter, without additional requirements, the desired Master's degree programme within the university system where the Bachelor's degree was acquired. The Rector may also demand proof of this, determining whether such proof must come from the home university or from another university in the country where the Bachelor's degree was acquired.

[1] ECTS: European Credit Transfer System. Credits describe the average time expended to achieve a learning goal. One credit corresponds to 30 hours of work.

[2] A Diploma from a Swiss university of applied sciences is considered equivalent to a Bachelor's degree in the same discipline. A Bachelor's degree from a German or Austrian university of applied sciences is considered equivalent to a Bachelor's degree from a Swiss university of applied sciences.

## 1.2 Academic prerequisites

### 1.2.1 Knowledge and competences

[1] Attendance of the Master's degree programme in Computer Science presupposes basic knowledge and competences in the disciplines Mathematics and Computer Science which must in content, scope and quality be equivalent to those covered in the ETH Bachelor's degree programme in Computer Science (discipline requirements profile).

[2] The **discipline requirements profile** comprises **79 ECTS credits** in total and is based on knowledge and competences covered in the ETH Bachelor's degree programme in Computer Science. This includes training in the relevant methodological scientific thinking.

[3] The discipline requirements profile is structured in two parts, as follows. Details regarding the content of the corresponding course units are published in the course catalogue (www.vvz.ethz.ch).

**Part 1: Basic knowledge and competences**

Part 1 comprises 63 ECTS credits and covers basic knowledge from the disciplines Mathematics and Computer Science. The substance of the following course units from the ETH Bachelor's degree programme in Computer Science is required:

*Mathematics* (34 credits)

Course units:

- Wahrscheinlichkeit und Statistik [Probability and Statistics] (6 credits)
- Analysis I und II (13 credits)
- Diskrete Mathematik [Discrete Mathematics] (8 credits)
- Lineare Algebra [Linear Algebra] (7 credits)

*Computer Science* (29 credits)

Course units:

- Theoretische Informatik [Theoretical Computer Science] (8 credits)
- Datenstrukturen und Algorithmen [Data Structures and Algorithms] (7 credits)
- Formale Methoden und Funktionale Programmierung [Formal Methods and Functional Programming] (7 credits)
- Numerische Methoden für Computational Science and Engineering [Numerical Methods for Computational Science and Engineering] (7 credits)

**Part 2: Subject-specific knowledge and competences**

Part 2 comprises 16 ECTS credits and covers knowledge primarily related to the chosen specialisation in the Master's degree course.

### 1.2.2 Admission with additional requirements

[1] If the academic prerequisites listed in 1.2.1 are not completely satisfied, admission may be granted subject to the acquisition of the missing knowledge and competences in the form of additional credits (admission with additional requirements).

[2] The candidate must provide proof of the acquisition of the additional knowledge and competences required by passing the pertaining performance assessments by set deadlines (see Section 5).

[3] If the candidate fails said performance assessments or does not respect the set deadlines he/she will be regarded as having failed the degree programme and will be excluded from it.

## 1.3 Language prerequisites

[1] The teaching language of the degree programme is English.

[2] For admission to the degree programme, proof of sufficient knowledge of English (level C1)[3] must be provided.

[3] Applicants to the degree programme who hold a Bachelor's degree from a university of applied sciences must, according to the pertaining additional requirements (see Section 2.2.4, Subsection 2), also supply proof of sufficient knowledge of German (level C1).

# 2 Specific stipulations for persons holding a Bachelor's degree in Computer Science

## 2.1 Bachelor's degree in Computer Science from ETH Zurich

*Unconditional admission*

[1] Holders of a Bachelor's degree in Computer Science from ETH Zurich are unconditionally admitted to the degree programme.

*Registration*

[2] Students of the Bachelor's degree programme in Computer Science already matriculated at ETH Zurich should enrol in the degree programme directly via www.mystudies.ethz.ch. The admission procedure outlined in Section 4 is dispensed with.

[3] The required language level is measured according to the Common European Framework of Reference for Languages (EFR) scale: *The Common European Framework of Reference for Languages*, p. 23f. *www.coe.int/t/dg4/linguistic/Source/Framework_EN.pdf*

*Entering the Master's degree programme*

[3] Students of the ETH Bachelor's degree programme in Computer Science may enrol directly in the Master's degree programme, as long as only a certain number of credits for the Bachelor's degree are pending. Listed in (a) and (b) below are the course unit categories in the Bachelor's programme where missing credits are admissible, and their permitted number. All credits for the Bachelor's degree in those course unit categories not listed here must be acquired.

a. Students whose programmes are subject to the Bachelor Programme Regulations **2003**([4] may enrol on condition that only **40 credits** are pending. Details:

| *Category* | *Permitted number of missing credits* |
|---|---|
| – Core subjects | 12 |
| – Major (lectures) | 20 |
| – Major (independent work) | 5 |
| – Compulsory electives GESS | 3 |

b. Students whose programmes are subject to the Bachelor Programme Regulations **2008**([5]may enrol on condition that **only 21 credits** are pending. Details:

| *Category* | *Permitted number of missing credits* |
|---|---|
| – Electives from the major | 15 |
| – Compulsary electives GESS | 6 |

[4] For all Bachelor's degree students already matriculated at ETH Zurich who progress to the ETH Master's degree programme, the following applies:

a. The normal ETH enrolment dates and deadlines apply.

b. Admission is provisional until the Bachelor's degree is issued. Admission will be revoked if the Bachelor's degree is not or cannot be issued.

## 2.2 Other Bachelor's degrees in Computer Science

### 2.2.1 General regulations

*Application*

[1] Interested parties holding a Bachelor's degree in Computer Science which was not issued by ETH Zurich should apply through the ETH Zurich Admissions Office for admission to the degree programme and are subject to the admissions procedure set out in Section 4.

[4] **RSETHZ** 323.1.1600.10
[5] **RSETHZ** 323.1.1600.11

*Entering the Master's degree programme*

[2] Candidates who have been granted admission may enter the programme when they have completed the preceding Bachelor's degree programme.

### 2.2.2 Bachelor's degree in Computer Science from another Swiss university or from an IDEA-League partner university

*Admission*

[1] Admission to the degree programme is guaranteed for those holding a Bachelor's degree or equivalent qualification in Computer Science from

a. another Swiss university
b. an IDEA-League partner university

[2] Admission is subject to fulfilment of the language prerequisites listed in (1.3).

[3] Admission may be subject to additional requirements.

### 2.2.3 Bachelor's degree in Computer Science from other universities

*Admission*

[1] For admission to the degree programme all the prerequisites listed in Section 1 must be satisfied.

[2] Admission may be subject to additional requirements.

[3] Admission is not possible if the number of additional credits required to satisfy the academic prerequisites exceeds

a. 30 credits in total, or
b. 15 credits from Part 1 of said academic prerequisites (see Section 1.2.1).

### 2.2.4 Bachelor's degree in Computer Science from a Swiss university of applied sciences

*Admission*

[1] Admission to the degree programme is guaranteed for those holding a Bachelor's degree in Computer Science from a Swiss university of applied sciences, as long as

a. the final Bachelor's degree grade is at least a 5 [according to the Swiss grading system, which involves grades from 1 (lowest) to 6 (highest)],[6] and
b. the language prerequisites set out in Section 1.3 are satisfied.

[6] The total grade is always calculated by ETH Zurich. The method of computation used, and other details such as how letter grades are transposed, are stipulated in the Directive on Admission to Master's Degree Programmes.

[2] Admission is always subject to the acquisition of additional study achievements comprising 43 credits.

[3] The additional requirements to be fulfilled by candidates are structured in the three parts listed below. The individual course units involved are part of the curriculum of the ETH Bachelor's degree programme in Computer Science. Information on the content of these course units is provided in the course catalogue (www.vvz.ethz.ch).

## Additional requirements

### Part 1: Basics of Computer Science: compulsory subjects

Part 1 of the additional requirements stipulates the completion of the following two course units from the subjects of Mathematics and Computer Science. The corresponding examinations are integrated into an *examination block*.

- Wahrscheinlichkeit und Statistik [Probability and Statistics] (6 credits)
- Theoretische Informatik [Theoretical Computer Science] (8 credits)

### Part 2: Basics of Computer Science: electives

Part 2 of the additional requirements stipulates the completion of three out of the four course units from the subjects of Mathematics and Computer Science listed below. Each individual examination must be sat and passed individually; their integration into an examination block is not allowed.

- Analysis I and II (13 credits)
- Diskrete Mathematik [Discrete Mathematics] (8 credits)
- Lineare Algebra [Linear Algebra] (7 credits)
- Datenstrukturen und Algorithmen [Data Structures and Algorithms] (7 credits)

### Part 3: Basics of the Master's degree specialisation: electives

Part 3 of the additional requirements stipulates the completion of one of the following three course units from the subject of Computer Science; the course unit selected should be aligned with the Master's degree specialisation. Pass grades in each of the corresponding individual examinations are required.

- Formale Methoden und Funktionale Programmierung [Formal Methods and Functional Programming] (7 credits)
- Numerische Methoden in Computational Science and Engineering [Numerical Methods in Computer Science and Engineering] (7 credits)
- Data Modelling and Data Bases (7 credits)

# 3 Specific stipulations for persons holding Bachelor's degrees in other disciplines

## 3.1 General regulations

*Application*

[1] Interested parties who hold a qualifying Bachelor's degree in a discipline other than Computer Science should apply for the Master's degree programme via the ETH Zurich Admissions Office, and are subject to the admissions procedure set out in Section 4.

*Admission*

[2] For admission to the degree programme all the prerequisites set out in Section 1 must be satisfied. Very good performance in the preceding course of studies is also required.

[3] Admission may be subject to additional requirements.

[4] Admission is not possible if more than 30 additional credits must be acquired in order to satisfy the academic prerequisites.

## 3.2 Bachelor's degree from ETH Zurich

*Entering the Master's degree programme*

[1] Students from an ETH Bachelor's degree programme who have been granted admission can enrol in the programme once they have acquired that number of credits which would qualify them to enrol in the Master's degree programme consecutive to their original subject.[7]

[2] For all Bachelor's degree students who are already matriculated at ETH Zurich and who progress to an ETH Master's degree programme, the following applies:

a. The normal ETH enrolment dates and deadlines apply.
b. Admission is provisional until the Bachelor's degree is issued. Admission will be revoked if the Bachelor's degree is not or cannot be issued.

## 3.3 Bachelor's degree from another university

*Entering the Master's degree programme*

Candidates who have been granted admission can enter the programme when they have completed the preceding Bachelor's degree programme.

[7] The permitted number of missing credits is set out in the Programme Regulations of the respective consecutive Master's degree programme (e.g., B.Sc. Physics > M.Sc. Physics).

# 4 Application and admission procedure

[1] All interested parties – with the exception of matriculated ETH Zurich students from the Bachelor's degree programme in Computer Science – must submit an application for admission to the degree programme. The specifications for application, in particular the documents required and the dates/deadlines for submission, are published on the website of the ETH Zurich Admissions Office (www.admission.ethz.ch).

[2] Application may be made even if the required preceding degree has not yet been issued.

[3] The admissions committee of the degree programme determines how far the background of the candidate corresponds to the profile of requirements and submits an application for admission/rejection to the Director of Studies.

[4] The Rector makes the final decision regarding admission without additional requirements, admission with additional requirements, or rejection.

[5] The candidate receives a written admissions decision which includes relevant information concerning any additional admission requirements.

# 5 Fulfilling additional admission requirements

## 5.1 General regulations

[1] Candidates who are admitted subject to the fulfilment of additional requirements must acquire the required additional knowledge and competences before or during the Master's programme via self-study or by attending classes. The corresponding individual performance assessments must take place by set deadlines.

[2] If the candidate fails said performance assessments or does not respect the set deadlines he/she will be regarded as having failed the degree programme and will be excluded from it.

[3] The deadlines and conditions for undergoing said performance assessments depend upon the background of the candidate (see Sections 5.2 and 5.3).

## 5.2 Candidates with a university Bachelor's degree

[1] Candidates holding a university Bachelor's degree must undertake all of the performance assessments pertaining to the additional admission requirements by the end of the first year of the Master's programme at the latest. All additional requirements, including any assessment repetitions, must be fulfilled within 18 months of the start of the Master's programme at the latest.

[2] A pass grade in each individual performance assessment is required.

[3] A failed performance assessment may be repeated once.

## 5.3 Candidates with a Bachelor's degree from a Swiss university of applied sciences

[1] Candidates holding a Bachelor's degree from a Swiss university of applied sciences must undertake all of the performance assessments pertaining to the additional admission requirements by the end of the first year of the Master's programme at the latest. All additional requirements, including any assessment repetitions, must be fulfilled within two years of the start of the Master's programme at the latest.

[2] The performance assessments may be undertaken as examination blocks. A pass grade in the examination block is achieved if the average of the individual grades is at least a 4.

[3] A failed performance assessment or a failed examination block may be repeated once. Repeating an examination block entails repeating all of the performance assessments belonging to it.