

**Programme Regulations 2014**  
**for the Master's degree programme in Computational**  
**Science and Engineering**  
**Department of Mathematics**

10 June 2014 <sup>(1)</sup>

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

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Version: **8 December 2015 – 1**

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<sup>1</sup> Version with amendments pursuant to the D-MATH Department Conference resolution of 29 September 2015 and 8 December 2015. This version of the Programme Regulations (8 December 2015 – 1) replaces the previous version (10 June 2014 – 0).

# Programme Regulations 2014 for the Master's degree programme in Computational Science and Engineering

## Department of Mathematics

10 June 2014 (Version: 8 December 2015)

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

The *ETH Zurich Executive Board*,  
pursuant to Art. 4 Para. 1 (a) of the ETH Zurich Organisational Ordinance  
(*Organisationsverordnung* ETH Zürich) of 16 December 2003<sup>2</sup>,  
decrees:

## Chapter 1: General regulations

### Part 1: General

#### Art. 1 Subject and scope, appendix

1

These Programme Regulations set out the requirements in accordance with which the Master's degree in Computation Science and Engineering at the ETH Zurich Department of Mathematics (D-MATH) may be acquired.

2

The Appendix is a part of these Programme Regulations. Any changes to the Appendix are subject to the approval of the Rector, on the request of or in consultation with D-MATH.

#### Art. 2 Academic title

1

Upon successful completion of the Master's degree in Computational Science and Engineering (degree programme) ETH Zurich awards graduates the following academic title (in German):

Master of Science ETH in Rechnergestützten Wissenschaften (abbreviation:  
MSc ETH RW).

2

The English form of this title is:

Master of Science ETH in Computational Science and Engineering  
(abbreviation: MSc ETH CSE).

3

This title may also be used in the abbreviated form: 'MSc ETH'.

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<sup>2</sup> RSETHZ 201.021

### **Art. 3** Legal basis

These Programme Regulations are based upon the stipulations set out in the following legal documents:

- a. Ordinance on Course Units and Performance Assessments at ETH Zurich of 22 May 2012<sup>3</sup>(Leistungskontrollenverordnung ETH Zürich);
- b. Ordinance on Admission to Studying at ETH Zurich of 30 November 2010<sup>4</sup> (Zulassungsverordnung ETH Zürich).

### **Art. 4** Course Catalogue

<sup>1</sup> D-MATH lists the course units for the degree programme in the Course Catalogue. This list is binding.

<sup>2</sup> Details regarding entries in the Course Catalogue are set out in Art. 4 of the General Ordinance on Performance Assessments at ETH Zurich<sup>5</sup> and in the corresponding implementation stipulations<sup>6</sup> of the Rector.

## **Part 2: Credit system**

### **Art. 5** Policy

<sup>1</sup> The degree programme follows a credit system which is aligned with the European Credit Transfer System (ECTS).

<sup>2</sup> ETH Zurich deploys the ECTS in accordance with the Credit System Guidelines<sup>7</sup> of the Rector (Richtlinien zum Kreditsystem).

### **Art. 6** Credits, basis for calculation

<sup>1</sup> In line with the ECTS, credits describe the average time expenditure required for a student to earn a study achievement.

<sup>2</sup> One credit corresponds to a workload of 30 hours. The workload includes all course-related activities required to obtain credits.

<sup>3</sup> The curriculum is designed in such a way that full-time students can acquire an average of 30 credits per semester.

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<sup>3</sup> RSETHZ 322.021en (in English), SR 414.135.1 (in German)

<sup>4</sup> (Only in German) SR 414.131.52, RSETHZ 310.5

<sup>5</sup> RSETHZ 322.021en (in English), SR 414.135.1 (in German)

<sup>6</sup> See: [www.weisungen.ethz.ch](http://www.weisungen.ethz.ch) (only in German)

<sup>7</sup> See: [www.directives.ethz.ch](http://www.directives.ethz.ch)

**Art. 7** Allocation of credits to course units

1 D-MATH allocates a certain number of credits to each of the course units it offers.

2 If an ETH Zurich course unit is found on the curriculum of more than one ETH Zurich degree programme, the department offering the course unit assigns it a standard number of credits in consultation with those integrating it into a programme. The Rector settles any disagreements.

3 If a course unit is offered by another university that university is responsible for allocating it a certain number of credits.

**Art. 8** Issuing of credits

1 Credits are issued for satisfactory performance. Performance is considered satisfactory if it has been awarded a grade of at least a 4, or a 'pass'.

2 No credits are issued for unsatisfactory performance.

3 The full number of credits is always issued if the prerequisites of Para. 1 have been satisfied. Partial issue of credits is not permitted.

4 The number of credits issued is that number published in the Course Catalogue valid at the time the performance assessment was undertaken.

**Art. 9** Recording, checking, registration

D-MATH records, checks and registers the credits acquired.

## **Chapter 2: Content, structure and scope of the Master's degree programme**

### **Part 1: Content, structure and scope**

#### **Art. 10** Programme content

The Master's degree programme builds on the ETH Zurich Bachelor's degree programme in Computational Science and Engineering. In addition to an interdisciplinary programme in applied areas of Natural Sciences and Engineering Sciences, the important mathematical methods and computer science tools in these areas are also covered. The study programme is concluded with a Master's thesis. With the Master's thesis, students demonstrate their ability to produce independent, structured scientific work. The Master's degree serves as preparation for entry into the world of work or doctoral studies.

#### **Art. 11** Academic procedure, Study Guide, study advisory service and student exchange

1

Academic procedures are explained in the degree programme Study Guide.

2

The CSE study advisor provides support to students with questions about study options and student exchange. Stipulations governing student exchange are set out in Art. 15.

#### **Art. 12** Scope, duration, limits on duration of studies

1

As stipulated in Art. 30, 90 credits are required to obtain a Master's degree.

2

The normal duration of the degree programme is one and a half years.

3

The maximum permitted duration of studies is three years. The Rector may extend this if cogent grounds are provided in a request submitted by the relevant deadline.

4

If admission to the degree programme is granted subject to the acquisition of additional credits (admission with additional requirements) the maximum permitted duration of studies may be extended by half a year for required extra credits in the range of 21 – 30 and by one year for required extra credits in the range of 31 – 60. For fewer than 21 required extra credits no extension is granted.

**Art. 13** Language of instruction

Course units and the corresponding performance assessments are normally conducted in English. The language of instruction is subject to the corresponding implementation provisions<sup>8</sup> of the Rector.

**Art. 14** Admission to course units

Special admission prerequisites may apply to the attendance of a particular course unit. These are determined by the ETH Zurich department or the university which offers the course unit.

**Art. 15** Student exchange (outgoing students)

<sup>1</sup> During the Master's degree programme credits may be acquired at other universities (mobility credits). Of these a maximum of 30 may be counted towards the Master's degree. The stipulations of Para. 3 and 4 still apply.

<sup>2</sup> If course units of other universities belong to the Master's degree programme curriculum, the corresponding credits do not qualify as mobility credits.

<sup>3</sup> The following applies for students who did not complete the preceding (Bachelor's) degree at ETH Zurich:

- a. They may not take part in ETH Zurich exchange programmes.
- b. Individual exchange stays are possible, but the recognition of mobility credits towards the Master's degree is not possible.

<sup>4</sup> If admission to the degree programme is subject to the acquisition of additional credits (admission with additional requirements) an exchange stay is only possible after all additional requirements have been fulfilled. Moreover, mobility credits may not be counted towards fulfilment of additional requirements.

<sup>5</sup> Before an exchange stay students must draw up a written study plan with the help of the CSE tutor. The study plan must detail the credits to be obtained at the host university. The study plan is subject to approval by the Director of Studies<sup>9</sup>.

<sup>6</sup> The Director of Studies makes the final decision on recognition of mobility credits. Handling of the proof of academic achievement is governed by Art. 16 of the ETH Zurich Ordinance on Performance Assessments<sup>10</sup> and the corresponding implementation provisions<sup>11</sup> of the Rector.

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<sup>8</sup> See: [www.directives.ethz.ch](http://www.directives.ethz.ch)

<sup>9</sup> Relating to the German version of this document, 'Studiendelegierten' was renamed 'Studiendirektor' (Director of Studies) on 1 August 2015 (pursuant to Art. 45 Para. 1 (f) of the ETH Zurich Organisation Ordinance). This change is taken into account throughout the text

<sup>10</sup> RSETHZ 322.021en (in English), SR 414.135.1 (in German)

<sup>11</sup> See: [www.directives.ethz.ch](http://www.directives.ethz.ch)

## Part 2: Categories

### Art. 16 Grouping by category

1

To obtain a Master's degree study achievements are required in the following categories. The minimum number of credits required in each category is set out in Art. 30.

- a. Core courses;
- b. Fields of specialisation;
- c. Electives
- d. Case studies;
- e. Semester project;
- f. Compulsory elective in Humanities, Social and Political Sciences;
- g. Master's thesis.

2

D-MATH assigns course units to the categories in Para. 1 and publishes them in the Course Catalogue.

### Art. 17 Overview of categories

1

**Core courses:** Core courses cover computational mathematical methods and advanced computer science skills. They are of central importance for Computational Science and Engineering. Stipulations governing performance assessment are set out in Art. 26.

2

**Fields of specialisation:** These cover in-depth knowledge of applied areas of Computational Science and Engineering. The fields of specialisation available, each comprising several course units, are listed in the Course Catalogue. Stipulations on attendance options and performance assessments are found in Art. 26.

3

**Electives:** These enable students to extend and deepen their theoretical and methodological knowledge. Relevant stipulations, including those governing performance assessments, are set out in Art. 26.

4

**Case studies:** In the case studies, ETH Zurich-internal and external speakers present case studies from their own areas of application – from modelling to computer-based problem-solving. Relevant stipulations, including those governing performance assessments, are set out in Art. 27.

5

**Semester project:** The aim of the semester project is to deepen knowledge in a specific subject area. An additional aim is for students to also learn to work in an existing academic group and – by coming into contact with applications – use a computational approach to solving problems in these application areas. Relevant stipulations, including those governing performance assessment, are set out in Art. 28.

6

**Compulsory elective in Humanities, Social and Political Sciences: Students** must complete general course units from the range of courses for the compulsory elective in Humanities, Social and Political Sciences (GESS). The stipulations are set out in the directives<sup>12</sup> on the Compulsory Elective in Humanities, Social and Political Sciences (GESS); stipulations on performance assessments are set out in Art. 26.

7

**Master's thesis:** This concludes the degree programme. With the Master's thesis students must demonstrate their ability to produce independent, structured scientific work. The relevant stipulations are set out in Art. 29.

### **Chapter 3: Admission to the Master's degree programme**

#### **Art. 18 Prerequisites for admission**

1

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

- a. A university Bachelor's degree comprising at least 180 credits or an equivalent university degree in Computational Science and Engineering or in another qualifying discipline; or
- b. A Bachelor's degree in a qualifying discipline from a Swiss university of applied sciences comprising at least 180 credits.

2

Details of the academic and language prerequisites for admission to the degree programme (profile of requirements) are set out in the Appendix.

#### **Art. 19 Registration/application, admissions procedure and entry to the Master's degree programme**

1

Students matriculated at ETH Zurich in the Bachelor's degree programme in Computational Science and Engineering may enrol directly in the Master's degree programme in Computational Science and Engineering.

2

All other candidates should apply to the ETH Zurich Rectorate for admission to the degree programme.

3

The CSE admissions committee investigates candidates' academic backgrounds and suitability for the Master's degree programme. The Chair of the admissions committee<sup>13</sup> formulates and submits an application for admission/rejection to the Rector.

4

On the basis of this application the Rector makes the final decision regarding admission without additional requirements, admission with additional requirements, or rejection.

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<sup>12</sup> See: [www.directives.ethz.ch](http://www.directives.ethz.ch)

<sup>13</sup> The Chair of the admissions committee must be an ETH Zurich professor.

5

The Rector may, depending on the candidate's qualifications and previous knowledge, make admission conditional upon the acquisition of additional knowledge and competences by a certain deadline during the Master's degree programme (admission with additional requirements).

6

Details regarding application or registration, the admission procedure and entry to the Master's degree programme are determined by the Rector. They are set out in the Appendix.

## **Chapter 4: Performance assessments**

### **Part 1: General regulations**

#### **Art. 20** Performance evaluation

Examinations and the Master's thesis are graded. Performance in other forms of performance assessment is either graded or evaluated on a pass/fail basis.

#### **Art. 21** Admission to performance assessments

Admission to performance assessments may be subject to conditions. If these conditions are not specified in these Program Regulations, they are determined by the ETH Zurich department or the university which offers the course unit.

#### **Art. 22** Registering/deregistering for performance assessments

1

The following stipulations apply to registration/deregistration for performance assessments at ETH Zurich:

- a. If the performance assessments in question are end-of-semester examinations or session examinations, registration and deregistration are governed by the stipulations of the ETH Zurich Ordinance on Performance Assessments<sup>14</sup> and the corresponding implementation provisions<sup>15</sup> of the Rector;
- b. If the performance assessments fall into another category, registration and deregistration are normally handled directly by the respective lecturer.

2

If the performance assessments concerned are those of another university, registration and deregistration are subject to the rules of that university.

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<sup>14</sup> RSETHZ 322.021en (in English), SR 414.135.1 (in German)

<sup>15</sup> See: [www.directives.ethz.ch](http://www.directives.ethz.ch)

**Art. 23** Absence, interruption, abandonment, late submission or non-submission

The following stipulations apply to absence from, interruption or abandonment of, and late submission or non-submission of performance assessments:

- a. If the performance assessments are at ETH Zurich, they are governed by the stipulations of the ETH Zurich Ordinance on Performance Assessments<sup>(16)</sup> and the corresponding implementation provisions<sup>(17)</sup> of the Rector.
- b. For performance assessments of other universities the rules of the respective university apply.

**Art. 24** Issuing of results, disagreements

1

Students may view all of their performance results via the internet in the respective ETH Zurich application. They are periodically informed by email when their examination results become viewable.

2

Every communication outlines the procedure in cases of disagreement about newly documented results.

**Art. 25** Dishonest conduct

The sanctions for dishonest conduct in the context of performance assessments are governed by the Disciplinary Code of ETH Zurich (Disziplinarordnung ETH Zurich) of 2 November 2004<sup>(18)</sup>.

**Part 2: Performance assessments in the Master's degree programme**

**Art. 26** Core courses, fields of specialisation, electives, compulsory elective in Humanities, Social and Political Sciences (GESS)

1

Every course unit in the 'core courses', 'fields of specialisation', 'electives' and 'compulsory elective in Humanities, Social and Political Sciences (GESS)' categories is subject to a performance assessment.

2

If a course unit is offered by ETH Zurich, the modes of performance assessments for the course unit are listed in the Course Catalogue.

3

If a course unit is offered by another university that university determines the performance assessment mode of that course unit.

4

A performance assessment is passed if it is awarded a grade of at least a 4 or a 'pass'.

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<sup>16</sup> RSETHZ 322.021en (in English), SR 414.135.1 (in German)

<sup>17</sup> See: [www.directives.ethz.ch](http://www.directives.ethz.ch)

<sup>18</sup> RSETHZ 361.1en (in English), SR 414.138.1 (in German)

5

A failed performance assessment may be repeated once unless the ETH Zurich department or the university offering the respective course unit stipulates otherwise.

6

Moreover, at least two course units from the 'core courses' category must be successfully completed in order to obtain the Master's degree.<sup>(19)</sup>

7

Furthermore, in the 'fields of specialisation' category:

- a. Five course units, including one seminar, must be successfully completed in order to obtain the Master's degree.
- b. Attendance option 1 applies to students who have completed a Bachelor's degree programme other than the ETH Bachelor's degree programme in CSE. In this case, the five course units in this category, including the seminar, must all be in the same field of specialisation.
- c. Attendance option 2 applies to students who have completed the ETH Bachelor's degree programme in CSE. These students can choose one of the following two options:
  1. The five course units, including the seminar, are all in the same field of specialisation. This option is only permitted if the field of specialisation in question has not already been covered in the Bachelor's degree studies.
  2. Three course units, including the seminar, are from the fields of specialisation covered in the Bachelor's degree; two course units are from a different field of specialisation.
- d. For students who successfully completed course units from the fields of specialisation during their ETH Bachelor's degree studies, but did not use the corresponding credits for the acquisition of the Bachelor's degree, these credits can be used for the acquisition of the Master's degree as follows:
  1. in the 'fields of specialisation' category, provided that the conditions in (c) are met; or
  2. in the 'electives' category.
- e. If cogent grounds are given, the Director of Studies may allow students to choose other course units than those available in the field of specialisation.

8

Furthermore, in the 'electives' category:

- a. A minimum of two course units must be successfully completed in order to obtain the Master's degree.
- b. Course units in the 'fields of specialisation' category may also be credited as electives.
- c. Course units in the 'core courses' category cannot be counted as electives.
- d. If cogent grounds are given, the Director of Studies may allow students to choose other course units as electives than those that are listed.

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<sup>19</sup> The range of courses offered in the 'core courses' category must include at least three course units.

**Art. 27** Case studies

- 1 There is a semester performance assessment for each course unit in the 'case studies' category.
- 2 Semester performance is evaluated on a pass/fail basis.
- 3 A failed semester performance assessment cannot be repeated. In order to earn the necessary credits, another course unit in the 'case studies' category must be attended and the required semester performance assessment must be evaluated as 'passed'.
- 4 Furthermore, in the 'case studies' category:
  - a. One course unit is offered per semester.
  - b. A minimum of two course units must be successfully completed in order to obtain the Master's degree. The Director of Studies may grant exceptions in the case of an exchange stay.

**Art. 28** Semester project

- 1 The semester project is carried out under the supervision of a lecturer and is written on a topic relating to a core course or field of specialisation. The Director of Studies may grant exceptions if cogent grounds are given.
- 2 The semester project leader defines the terms of reference and sets the dates for the start and delivery of the project work.
- 3 The semester project is concluded with a written report and a presentation.
- 4 It is evaluated on a pass/fail basis.
- 5 A failed semester project cannot be repeated. In order to earn the necessary credits, another semester project must be authored and it must be evaluated as 'passed'.

## **Art. 29** Master's thesis

1

A student is only permitted to commence the Master's thesis if all of the following are true:

- a. the student has successfully concluded the Bachelor's degree studies;
- b. the student has fulfilled any additional requirements for admission to the degree programme; and
- c. the student has completed at least the following coursework in the Master's degree studies:
  1. passed at least two course units in the 'core courses' category;
  2. passed five course units, including one seminar, in the 'fields of specialisation' category in accordance with Art. 26 Para. 7, and
  3. passed the semester project in accordance with Art. 28.

1 bis

<sup>(20)</sup>If cogent grounds are given, the Director of Studies may grant exceptions to the admission prerequisites listed in Para. 1 (c). There can be no exceptions to the admission prerequisites listed in (a) and (b).

2

The Master's thesis is carried out under the supervision of an ETH Zurich professor. It is conducted on a topic relating to a core course or field of specialisation. The Director of Studies may grant exceptions if cogent grounds are given.

3

<sup>(21)</sup>The maximum time period for the completion of the Master's thesis is 28 weeks<sup>(22)</sup>. On request the Director of Studies can extend the deadline if important grounds are given.

4

The leader of the Master's thesis defines the terms of reference and sets the dates for the start and delivery of the work. The work is concluded with a written report and a presentation.

5

The Master's thesis is graded. It is passed if it is awarded a grade of at least a 4.

6

A failed Master's thesis project may only be repeated once. If it is repeated, a new topic must be addressed. The repetition may be conducted with a new supervisor.

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<sup>20</sup> Inserted pursuant to the D-MATH Department Conference resolution of 29 September 2015, in force since 1 September 2015.

<sup>21</sup> Pursuant to the D-MATH Department Conference resolution of 8 December 2015 (extension of the time period for completion from five to six months). Valid for Master's theses begun on or after 1 January 2016.

<sup>22</sup> The 28 weeks are composed of: 26 weeks for the actual work, plus 2 weeks to compensate for public holidays, sick days and other short-term absences.

## Chapter 5: Issuing of the Master's degree

### Part 1: Credits per category and degree request

#### Art. 30 Credits per category

1

90 credits are required for the Master's degree, of which the specified minimum number of credits must be achieved in each of the following categories. The relevant stipulations are set out in Para. 2.

|  |            |
|--|------------|
| a. Main fields   | 44 credits |
| 1. Core courses (min. 12 credits)  |            |
| 2. Fields of specialisation (min. 18 credits)                              |            |
| 3. Electives (min. 6 credits)  |            |
| b. Case studies  | 6 credits  |
| c. Semester project  | 8 credits  |
| d. Compulsory elective in Humanities, Social and Political Sciences (GESS) | 2 credits  |
| e. Master's thesis   | 30 credits |

2

Of the required 44 credits in the 'main fields' category (Para. 1 (a)) at least 12 credits must be in the core courses, at least 18 credits in the fields of specialisation and at least 6 credits in electives. In addition,

- a. In the 'core courses' subcategory, at least two course units must be successfully completed, regardless of whether the purely numerical minimum of 12 credits has already been achieved with a single course unit.
- b. In the 'fields of specialisation' subcategory, five course units, including a seminar, must be successfully completed, regardless of whether the purely numerical minimum of 18 credits has been achieved with less than five course units. Crediting of more than five course units in this subcategory is not permitted. Extra course units can be credited in the 'electives' subcategory.
- c. In the 'electives' subcategory, at least two course units must be successfully completed, regardless of whether the purely numerical minimum of 6 credits has already been achieved with a single course unit.

## **Art. 31** Degree request

1

Students may request the issue of the Master's degree when they have fulfilled the requirements set out in Art. 30. The degree request must be made within three years of starting the Master's degree programme. If a request providing important grounds is submitted by the designated deadline the Rector may extend the deadline for the degree request.

2

The request should contain all the performance achievements with pass grades in the categories and subcategories listed in Art. 30 which are to be listed in the academic record. In each category and subcategory the sum of the minimum number of credits set out in Art. 30 must be acquired.

3

The credits acquired by completing a course unit may not be split or counted more than once.

4

A maximum of 30 mobility credits can be counted towards the Master's degree. The restrictions stipulated in Art. 15 still apply.

5

A maximum of 100 credits can be counted towards the Master's degree.

6

The recognition of performance achievements or credits from a previous degree programme is not permitted. There are exceptions to this which are set out in Para. 7.

7

Credits earned at ETH Zurich prior to the Master's degree studies may be recognised provided that the respective knowledge and skills gained are in content part of the degree programme and the respective credits have not already been counted towards a degree. The Rector decides whether to recognise the credits on the basis of the request of the Director of Studies. There is no automatic right to recognition.

## **Part 2: Academic record, degree certificate and Diploma Supplement**

### **Art. 32** Documents

Students who successfully complete the degree programme receive three documents: an academic record, a degree certificate and a Diploma Supplement.

### **Art. 33** Academic record

1

The academic record serves as verification of the completed Master's degree.

2

The academic record contains:

- a. the academic performance listed in the degree request as per Art. 31, Para. 2, including grades and other performance evaluation indicators; and
- b. the final grade, calculated in accordance with the stipulations of Para. 4.

- 3 A separate sheet of the academic record lists:
- a. Any additional admission requirements, and
  - b. All further study achievements according to the corresponding implementation provisions<sup>(23)</sup> of the Rector.
- 4 The final grade is calculated as the weighted average of the following grades
- a. The grades in the core courses each grade weighted 2
  - b. The four grades in the fields of specialisation each grade weighted 1
  - c. The grades in the electives each grade weighted 1
  - d. The grade in the Master's thesis grade weighted 4
- 5 D-MATH records, checks and registers the grades and other performance evaluation indicators and issues the academic record.

**Art. 34** Degree certificate and Diploma Supplement

- 1 Details regarding the degree certificate are set out in Art. 28 of the ETH Zurich Ordinance on Performance Assessments<sup>(24)</sup>.
- 2 The Diploma Supplement comprises a standardised explanation of the degree.

## **Chapter 6: Final clauses**

**Art. 35** Definitive failure, exclusion from the degree programme

- 1 The degree programme is regarded as definitively failed if either of the following applies:
- a. the conditions for obtaining the Master's degree (acquisition of the required number of credits for the Master's degree in accordance with the stipulations of Art. 30, or any other conditions) can no longer be satisfied due to failure of performance assessments or failure to respect programme deadlines<sup>(25)</sup>; or
  - b. in cases of admission with additional requirements said additional requirements have not been fulfilled due to failure of performance assessments or failure to respect the deadlines set for them.
- 2 Definitive failure results in exclusion from the degree programme.

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<sup>23</sup> See: [www.directives.ethz.ch](http://www.directives.ethz.ch)

<sup>24</sup> RSETHZ 322.021en (in English), SR 414.135.1 (in German)

<sup>25</sup> Programme deadlines are the deadline for undertaking a performance assessment, individual assigned deadlines and the maximum permitted duration of studies.

**Art. 36** Transcript of records for non-graduating students (exclusion from or abandonment of studies)

Students who are excluded from the degree programme or withdraw from it before obtaining the Master's degree may on request receive a transcript of records. This lists all performance achievements completed and evaluated before exclusion or withdrawal.

**Art. 37** Special cases

The Director of Studies settles cases which are not addressed or insufficiently addressed by these Programme Regulations and their Appendix, or other relevant ordinances and directives.

**Art. 38** Entry into effect

<sup>1</sup>

These Programme Regulations enter into effect at the beginning of Autumn Semester 2014.

<sup>2</sup>

They apply to Students who:

- a. enter this degree programme from Autumn Semester 2014, including re-entries into this degree programme from Autumn Semester 2014; or
- b. entered this degree programme before Autumn Semester 2014 and wish to complete the Master's degree programme according to the provisions of these Programme Regulations 2014 (request for change of regulations required).

On behalf of the Executive Board

President: Ralph Eichler

General Secretary: Hugo Bretscher

## Appendix

To the Programme Regulations 2014 of the  
Master's degree programme in Computational Science and Engineering (CSE)

31 August 2010 (Version: 1 March 2012)

*Applies to students who commence or recommence the degree programme in Autumn Semester 2012 or later.*

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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 CSE. It supplements the stipulations of the Admission Regulations of ETH Zurich and the Directive on Admission to Master's Degree Programmes.

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# 1 Profile of requirements

## *Policy*

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

## 1.1 Degree qualifications

<sup>1</sup> For admission to the degree programme one of the following is required:

- a. a university Bachelor's degree comprising at least 180 ECTS<sup>1</sup> credits or an equivalent university degree
- b. a Bachelor's degree from a Swiss university of applied sciences comprising at least 180 ECTS<sup>2</sup> credits

in a discipline in the context of which the academic prerequisites listed in 1.2 have been satisfied.

<sup>2</sup> ETH Zurich may also demand written proof from applicants that their Bachelor's degree qualifies them to enter the Master's degree programme consecutive to it at their home universities or at a university in the country where said Bachelor's degree was acquired.

## 1.2 Academic prerequisites

### 1.2.1 Knowledge and competences

<sup>1</sup> Attendance of the Master's degree programme in CSE presupposes basic knowledge and competences in Mathematics, Computer Science and applied areas of Natural Sciences and Engineering which are in content, scope and quality equivalent to those covered in the ETH Bachelor's degree programme in CSE.

<sup>2</sup> The **discipline requirements profile** comprises **88 ECTS credits** in total and is based on knowledge and competences covered in the ETH Bachelor's degree programme in CSE. This includes training in the relevant methodological scientific thinking.

The discipline requirements profile is structured in three parts. The substance of the following course units from the ETH Bachelor's degree programme in CSE is required. Information regarding the content of these course units is published in the course catalogue ([www.vvz.ethz.ch](http://www.vvz.ethz.ch)).

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<sup>1</sup> ECTS: European Credit Transfer System. Credits describe the average time expended to achieve a learning goal. One credit corresponds to 25-30 hours of work.

<sup>2</sup> 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.

**Part 1: Basic knowledge and competences**

Part 1 comprises 52 ECTS credits and covers basic knowledge, as follows:

**Basics of Mathematics** (22 credits)

- Analysis I and II (14 credits)
- Lineare Algebra [Linear Algebra] (4 credits)
- Informatik [Computer Science] I (4 credits)

**Further basics** (30 credits)

- Physik [Physics] I and II 8 credits)
- Programmier Techniken [Programming Techniques] (5 credits)
- Numerische Methoden [Numerical Methods] (7 credits)
- Stochastik [Stochastics] (4 credits)
- Two lectures in a specialisation (6 credits)

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

For Part 2 a total of 11 ECTS credits must be acquired in the following course units:

- Analysis III (4 credits)
- Technische Informatik [Computer Engineering] II (4 credits)
- Informationssysteme [Information Systems] (4 credits)
- Optimierungstechniken [Introduction to Optimization] (5 credits)
- Fluidodynamik für RW [Fluid Dynamics for CSE] (5 credits)
- Chemie für RW [Chemistry for CSE] (4 credits)
- Statistische Physik [Statistical Physics] (4 credits)
- Quantenmechanik [Quantum Mechanics] (4 credits)

**Part 3: Core knowledge**

Part 3 comprises 25 ECTS credits and covers knowledge and competences essential for the Master's degree.

- Numerical Methods for Partial Differential Equations (8 credits)
- High Performance Computing for Science and Engineering (11 credits)
- Software Design (6 credits)

## 1.2.2 Admission with additional requirements

<sup>1</sup> 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).

<sup>2</sup> 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 4).

<sup>3</sup> 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

<sup>1</sup> The teaching language of the degree programme is English.

<sup>2</sup> For admission to the degree programme, proof of sufficient knowledge of English (level C1)<sup>3</sup> must be provided.

<sup>3</sup> 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 2.4, Subsection 2), also supply proof of sufficient knowledge of German (level C1).

## 2 Specific stipulations for admission and entering the degree programme

### 2.1 Bachelor's degree in CSE from ETH Zurich

#### *Unconditional admission*

Holders of a Bachelor's degree in CSE from ETH Zurich are unconditionally admitted to the degree programme.

#### *Registration*

Students of the Bachelor's degree programme in CSE already matriculated at ETH Zurich should enrol in the degree programme directly via [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch). The admission procedure outlined in Section 3 is dispensed with.

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

### *Entering the Master's degree programme*

<sup>1</sup> 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.

<sup>2</sup> Students of the ETH Bachelor's degree programme in CSE may enrol directly in the programme, as long as

- a. a total of only 30 credits maximum towards the Bachelor's degree are pending
- b. the minimum number of credits required for the Bachelor's degree in the Bachelor's degree programme categories 'First-Year Subjects' and 'Basic Subjects' have been acquired.

## **2.2 Bachelor's degree in another discipline**

### **2.2.1 General regulations**

#### *Application*

Interested parties who hold a qualifying Bachelor's degree in a discipline other than CSE should apply for the programme via the ETH Zurich Admissions Office, and are subject to the admissions procedure set out in Section 3.

### **2.2.2 Bachelor's degree from ETH Zurich**

#### *Admission*

<sup>1</sup> For admission to the programme all the prerequisites set out in Section 1 must be satisfied. Very good performance in the preceding course of studies is also required.

<sup>2</sup> Admission may be subject to additional requirements.

<sup>3</sup> Admission is not possible if more than 30 additional credits must be acquired in order to satisfy the academic prerequisites.

### *Entering the Master's degree programme*

<sup>1</sup> 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.

<sup>2</sup> 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.<sup>4</sup>

### 2.2.3 Bachelor's degree from another university

#### *Admission*

<sup>1</sup> For admission to the programme all the prerequisites set out in Section 1 must be satisfied. Very good performance in the preceding course of studies is also required.

<sup>2</sup> Admission may be subject to additional requirements.

<sup>3</sup> Admission is not possible if more than 30 additional credits must be acquired in order to satisfy the academic prerequisites.

#### *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.

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

#### *Admission*

<sup>1</sup> For admission to the programme all the prerequisites set out in Section 1 must be satisfied. Very good performance in the preceding course of studies is also required.

<sup>2</sup> Admission is always subject to the acquisition of additional study achievements comprising at least 40 and at most 60 credits.

<sup>3</sup> Admission is not possible if the number of additional credits required to satisfy the academic prerequisites exceeds 60.

#### *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.

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<sup>4</sup> 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).

### 3 Application and admission procedure

<sup>1</sup> All interested parties – with the exception of matriculated ETH Zurich students from the Bachelor's degree programme in CSE – 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](http://www.admission.ethz.ch)).

<sup>2</sup> Application may be made even if the required preceding degree has not yet been issued.

<sup>3</sup> The admissions committee of the degree programme determines how far the background of the candidate corresponds to the profile of requirements. The Chair of the admissions committee<sup>5</sup> formulates and submits an application for admission/rejection to the Rector.

<sup>4</sup> On the basis of this application the Rector makes the final decision regarding admission without additional requirements, admission with additional requirements, or rejection.

<sup>5</sup> The candidate receives a written admissions decision which includes relevant information concerning any additional admission requirements.

### 4 Fulfilling additional admission requirements

#### 4.1 General regulations

<sup>1</sup> 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.

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

<sup>3</sup> The deadlines and conditions for undergoing said performance assessments depend upon the background of the candidate (see Sections 4.2 and 4.3).

#### 4.2 Candidates with a university Bachelor's degree

<sup>1</sup> 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

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<sup>5</sup> The Chair of the admissions committee must be an ETH Zurich professor.

assessment repetitions, must be fulfilled within 18 months of the start of the Master's programme at the latest.

<sup>2</sup> A pass grade in each individual performance assessment is required.

<sup>3</sup> A failed performance assessment may be repeated once.

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

<sup>1</sup> 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.

<sup>2</sup> 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.

<sup>3</sup> 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.