

**Departments of Mathematics and Physics**  
**Programme Regulations 2005**  
**Master Programme in**  
**Computational Science and Engineering**

24 May 2005

*(English is not an official language of the Swiss Confederation. This translation  
is provided for information purposes only and has no legal force.)*

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**Programme Regulations 2005**  
**Master Programme in Computational Science and Engineering**

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*The ETH Zurich Executive Board,*

pursuant to Art. 4, Para. 1, Lit. a of the ETH Zurich Organisation Ordinance of 16 December 2003<sup>1</sup>,

*hereby decrees:*

**Chapter 1:           General Regulations**

**Section 1:           General**

**Art. 1           Subject-matter and Scope, Appendix**

<sup>1</sup> These Programme Regulations determine the requirements under which the Master degree in Computational Science and Engineering can be acquired at the Departments of Mathematics and Physics, ETH Zurich (hereafter referred to as D-MATH/D-PHYS).

<sup>2</sup> The Appendix is part of these Programme Regulations. Any modifications to the Appendix are decided by the Rector, upon the request of, or following a hearing with D-MATH/D-PHYS.

**Art. 2           Academic Title**

<sup>1</sup> The Master degree in Computational Science and Engineering entitles its holders to bear the following academic title:

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

<sup>2</sup> The English title is:

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

<sup>3</sup> Holders of this Master degree can also use the abbreviated title “MSc ETH”.

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<sup>1</sup> RSETHZ 201.021 (available in German only)

### **Art. 3**      Legal Basis

These Programme Regulations are based on the following legal provisions:

- a. ETH Zurich General Ordinance on Performance Assessments of 10 September 2002<sup>2</sup> (AVL ETHZ – acronym for German document);
- b. Ordinance on Admission to Studying at ETH Zurich of 10 September 2002<sup>3</sup> (Zulassungsverordnung ETHZ).

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

D-MATH/D-PHYS determine the Master programme courses for each semester and list them in the course catalogue that is binding. This catalogue is submitted to the Rector for approval within the period stipulated. Specific details are outlined in Art. 28 of AVL ETHZ and in the corresponding implementation provisions.

### **Art. 5**            Language of Instruction

<sup>1</sup> Teaching and performance assessments are normally in English. The language used in any particular course is listed in the course catalogue.

<sup>2</sup> Should a performance assessment only be held in English, students may, upon request, complete the performance assessment in German. In such cases, students must hand in a request to the responsible examiner at the latest four weeks before the assessment is carried out.

<sup>3</sup> Students, who wish to complete a performance assessment in a language other than English or German, must obtain the agreement of the responsible examiner. An official request must be submitted within the time limit indicated in Para. 2.

## **Section 2:            Credit System**

### **Art. 6**      Principle

<sup>1</sup> The study programme is based on a credit system that complies with the European Credit Transfer System (ECTS).

<sup>2</sup> The implementation of ECTS at ETH Zurich is defined in the Guidelines<sup>4</sup> on the Credit System.

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<sup>2</sup> SR 414.135.1, RSETHZ 322.021 (available in German only)

<sup>3</sup> SR 414.131.52, RSETHZ 310.5 (available in German only)

<sup>4</sup> The guidelines can be accessed online at: [www.rektorat.ethz.ch/directives](http://www.rektorat.ethz.ch/directives) (available in German only)

## **Art. 7** Credits

Credits define the average amount of time required for a study performance.

## **Art. 8** Basis for Calculating Credits

When studying full-time, the entire student workload for each year of study comprises an average of 60 credits. The student workload includes all study-related activities necessary to obtain credits.

## **Art. 9** Allocation of Credits

<sup>1</sup> D-MATH/D-PHYS allocate a certain number of credits to their own courses, which are subsequently specified in the course catalogue.

<sup>2</sup> For courses that are part of the curriculum of several study programmes, the department offering the course uniformly allocates the credits in consultation with the departments concerned. The Rector decides in the case of disagreement.

## **Art. 10** Issuing Credits

<sup>1</sup> Credits are only issued for satisfactory performance. Study performances are considered satisfactory, if they are graded with at least 4 or as “passed”.

<sup>2</sup> No credits are issued for unsatisfactory performance.

<sup>3</sup> The full amount of credits is always issued for the course in question, when the prerequisites in Para. 1 have been fulfilled. Partial issuing of credits is not allowed.

<sup>4</sup> The number of credits to be issued is specified in the course catalogue valid at the time at which the performance assessment is completed.

## **Art. 11** Registering, Checking and Managing Credits

D-MATH/D-PHYS register, check and manage the credits.

## **Chapter 2: Content, Extent and Structure of the Master Programme**

### **Section 1: Content of the Programme, Extent and Structure**

#### **Art. 12** Content of the Programme

The Master programme in Computational Science and Engineering (CSE) builds on the ETH CSE Bachelor programme. In addition to acquiring an interdisciplinary education in application areas in science and engineering, important mathematical methods and computer science tools in both these areas are also taught. The programme concludes with a Master thesis in which the students show their ability to independently produce a coherent and scientific piece of work. The Master degree prepares graduates to enter the job market or leads onto doctoral studies. The scientific and methodological knowledge is complemented with electives in general education courses in Humanities, Social and Political Sciences (GESS).

#### **Art. 13** Extent and Duration of the Programme; Limitation on the Duration of Studies

<sup>1</sup> It is necessary to obtain 90 credits, as indicated in Art. 36, Para. 1, to acquire the Master degree. At least 60 of the required 90 credits must be acquired at ETH Zurich.

<sup>2</sup> The CSE Master programme is designed to be completed within one and a half years.

<sup>3</sup> The maximum duration of studies is three years. Upon request, the Rector can extend the duration of studies for compelling reasons.

<sup>4</sup> Should admission to the CSE Master programme be stipulated with the need to fulfil additional requirements, this entitles the extension of the maximum duration of studies as follows:

- six months to acquire 21 – 30 additional credits;
- one year to acquire 31 – 60 additional credits.

Should less than 21 additional credits have to be acquired, the maximum duration of studies is not extended.

#### **Art. 14** Study Procedure, Study Advisory Service

<sup>1</sup> D-MATH/D-PHYS compile a study guide to the CSE Master programme. It comprises an overview of the study programme.

<sup>2</sup> The CSE study advisor helps students to plan their course of study, particularly relating to exchange programmes.

**Art. 15** Recognition of Study Achievements Acquired outside the Master Programme

The Director of Studies ultimately decides on the recognition of study achievements acquired in other ETH Zurich study programmes or at other universities (e.g. student exchange) during the Master programme. Performance evaluations are handled in accordance with Art. 12 of AVL ETHZ<sup>5</sup>.

**Art. 16** Student Exchange

<sup>1</sup> During the Master programme, students can acquire credits at other universities. Of these mobility credits, a maximum of 30 can be recognised to obtain the Master degree. If requested by the student, any additional credits are listed in the addendum to the final academic record.

<sup>2</sup> Students, who wish to spend an exchange semester at another university, must first prepare a written study programme in collaboration with the CSE study advisor. This study programme specifies the credits to be acquired at the host university and has to be approved by the Director of Studies.

**Section 2: Subjects and Grouping according to Category**

**Art. 17** Grouping according to Category

<sup>1</sup> To acquire the Master degree, it is necessary to have study achievements in the following categories. The minimum number of credits required in each category is indicated in Art. 36.

- a. Core Courses and Compensatory Courses ;
- b. Fields of Specialisation;
- c. Electives;
- d. Case Studies;
- e. Semester Paper;
- f. Compulsory Electives in Humanities, Social and Political Sciences;
- g. Master Thesis.

<sup>2</sup> D-MATH/D-PHYS specify in the course catalogue which courses are allocated to each category as listed in Para. 1.

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<sup>5</sup> SR 414.135.1, RSETHZ 322.021

## Art. 18 Category Overview

<sup>1</sup> **Core Courses:** They serve to transfer computational scientific and mathematical methods, and advanced knowledge of Computer Science. They are of primary importance for Computational Science and Engineering.

<sup>2</sup> **Compensatory Courses:** If the required number of credits for the core courses cannot be acquired by not having passed the respective exams, these missing credits can be acquired in the compensatory courses. The maximum number of credits that can be compensated is specified in Art. 36, Para. 3.

<sup>3</sup> **Fields of Specialisation:** They serve to transfer in-depth knowledge of application areas of computational sciences and engineering. The fields of specialisation that can be chosen are listed in the course catalogue. Each field of specialisation consists of several courses. Further details are specified in Art. 29.

<sup>4</sup> **Electives:** They serve to broaden and deepen theoretical and methodological knowledge. Details are specified in Art. 30.

<sup>5</sup> **Case Studies:** In the course category Case Studies, ETH and external lecturers present case studies from their own application areas – from modelling to computational problem-solving. Details are specified in Art. 31.

<sup>6</sup> **Semester Paper:** This paper serves to deepen knowledge in a particular subject area. Furthermore, students learn to work in an established scientific group and, by becoming familiar with the applications, they also learn how to tackle problems from such applications computationally. Details are specified in Art. 32.

<sup>7</sup> **Compulsory Electives in Humanities, Social and Political Sciences:** Students have to choose courses from the general education courses in Humanities, Social and Political Sciences (GESS). Further details are specified in the Rector's directives on GESS compulsory electives.

<sup>8</sup> **Master Thesis:** It concludes the Master programme. By writing up the Master thesis, students show their ability to independently produce a coherent and scientific piece of work. Details are specified in Art. 34.

## **Chapter 3: Admission to the Master Programme**

### **Art. 19 Admission Prerequisites**

<sup>1</sup> To be eligible for admission to the CSE Master programme, candidates must fulfil one of the following prerequisites:

- a. They hold an ETH Zurich Bachelor degree in Computational Science and Engineering.
- b. They hold a Bachelor degree that corresponds to at least 180 ECTS credits, or an equivalent university degree, or a degree from a Swiss University of Applied Sciences in a scientific discipline qualifying for the CSE Master programme. Details on the required scientific knowledge (requirement profile) for the CSE Master programme are listed in Item 1 of the Appendix. The following also applies:
  1. Candidates must have adequate knowledge of English. If requested, they must be able to provide proof.
  2. If requested, candidates must provide proof that they would be admitted to the Master programme of the corresponding discipline at their home university or in their country of origin, should such a programme be available.
  3. Reservation is made for the provisions in Item 1.2 of the Appendix.

<sup>2</sup> The Rector decides on any exceptions on the request of the Director of Studies.

### **Art. 20 Admission Procedure**

<sup>1</sup> The admission procedure is managed according to the candidates' previous education. The following differentiation is made at the time of registration or application:

- a. Candidates, who are enrolled in the ETH Zurich CSE Bachelor programme (see Para. 2), or
- b. Candidates, who already hold an ETH Zurich CSE Bachelor degree (see Para. 3); or
- c. Candidates, who do not fulfil the prerequisites listed in Lit. a or b, but are enrolled at a university in a scientific discipline qualifying for the CSE Master programme, or hold a corresponding Bachelor degree, or at least an equivalent degree (see Para. 4).

<sup>2</sup> ETH Zurich students from the CSE Bachelor programme can directly enrol for the CSE Master programme when they only need to acquire a certain number of credits for the Bachelor degree. Details are specified in Item 2 of the Appendix. The following also applies:

- a. The regular dates and deadlines for enrolment at ETH Zurich are applicable.

- b. Admission is conditional if the Bachelor degree still has to be completed. The admission is revoked, if the Bachelor degree has not been acquired or cannot be acquired.
- c. The Rector decides on any exceptions on the request of the Director of Studies.

<sup>3</sup> Candidates, who already hold an ETH Zurich CSE Bachelor degree, have to contact the ETH Rectorate to enrol in the CSE Master programme.

<sup>4</sup> Candidates, who come in Para. 1, Lit. c, should send their application for admission to the CSE Master programme to the ETH Rectorate. They can submit their application before they have acquired their degree. The way in which applications are managed is determined by the Rector. The following also applies:

- a. The CSE Admissions Committee evaluates the candidates' applications in terms of their academic qualifications and aptitude for the Master programme, and requests the Director of Studies to either admit or reject the candidate, including the credits that can be recognised and those still to be acquired.
- b. Upon the request of the Director of Studies, the Rector decides on admission or rejection, including the credits that can be recognised and those still to be acquired.
- c. Candidates, who are not enrolled in an ETH Zurich Bachelor programme, can only enrol for the CSE Master programme when they have obtained their (Bachelor) degree.

#### **Art. 21** Admission without Additional Requirements

<sup>1</sup> An ETH Zurich CSE Bachelor degree qualifies for admission to the CSE Master programme without having to fulfil any additional requirements.

<sup>2</sup> Other university degrees allowing admission to the CSE Master programme without any additional requirements are listed in Item 3 of the Appendix.

#### **Art. 22** *abrogated*<sup>6</sup>

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<sup>6</sup> Art. 22 has been abrogated. Details on the rejection of admission are specified in Item 1.2 of the Appendix.

## **Chapter 4: Performance Assessment Regulations**

### **Section 1: General Regulations**

#### **Art. 23** Types of Performance Assessment, Performance Evaluation

<sup>1</sup> The CSE Master programme primarily involves the following types of performance assessment:

- a. examinations;
- b. written reports;
- c. presentations.

<sup>2</sup> Performance in an examination is graded. Other types of performance assessments are evaluated with a grade or with “passed/failed”.

#### **Art. 24** Conditions of Admission to Performance Assessments

<sup>1</sup> Conditions of admission to performance assessments can be implemented.

<sup>2</sup> D-MATH/D-PHYS verify that any conditions of admission to performance assessments have been fulfilled.

#### **Art. 25** Registering for End-of-Semester Examinations and Examination Sessions, Carrying out Examinations

<sup>1</sup> The AVL ETHZ regulations<sup>7</sup> and the Rector’s directives apply for courses offered by ETH Zurich with respect to registering for end-of-semester examinations and for examinations in the examination sessions as well for carrying out examinations.

<sup>2</sup> The regulations applicable at other universities apply for courses offered at other institutions with respect to registering for examinations.

#### **Art. 25a** Registration for other Performance Assessments

Registration is normally done directly via the responsible examiner for performance assessments not coming under Art. 25.

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<sup>7</sup> SR414.135.1, RSETHZ 322.021

## **Art. 26** Performance Assessments for Additional Requirements

<sup>1</sup> Performance assessments for courses defined as additional requirements for admission to the CSE Master programme can be grouped into examination blocks. Any such examination blocks are to be specified in the admission decree.

<sup>2</sup> If no examination blocks are formed, an appropriate means of compensation is to be provided should a performance assessment be failed twice.

<sup>3</sup> Should the additional requirements not be completely fulfilled due to the student having failed performance assessments, admission to the CSE Master programme is revoked. Should such candidates apply for an ETH Zurich Bachelor programme and be admitted, the following rules are effective for performance assessments already carried out to fulfil additional requirements:

- a. Performance assessments or examination blocks that have been passed can be recognised in the Bachelor programme. Any recognised performance assessments are allocated credits.
- b. No credits are allocated for performance assessments that have not been passed.
- c. The Rector decides on the recognition of credits upon the request of the responsible department.

## **Art. 27** Dishonest Behaviour

Details on dealing with dishonest behaviour with respect to performance assessments are specified in the ETH Zurich Disciplinary Code of 2 November 2004<sup>8</sup>.

## **Section 2: Performance Assessments**

### **Art. 28** Core Courses and Compensatory Courses

<sup>1</sup> Both core courses must be attended. If a core course is failed twice and the required number of credits cannot be obtained, these missing credits can be acquired in the compensatory courses. The maximum number of credits that can be compensated is specified in Art. 36, Para. 3.

<sup>2</sup> Each course in the category *Core Courses and Compensatory Courses* is evaluated with an examination.

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<sup>8</sup> SR 414.138.1, RSETHZ 361.1 (available in English: RSETHZ: 361.1 engl.)

## **Art. 29** Fields of Specialisation

<sup>1</sup> Five courses must be attended in the category *Fields of Specialisation*, one of which must be a seminar. The various means of attendance are specified in Para. 3 and 4.

<sup>2</sup> A seminar involves carrying out a semester performance. Each other course in the category *Fields of Specialisation* is evaluated with an examination.

<sup>3</sup> The following applies for students, who do not hold an ETH CSE Bachelor degree: the courses to be attended, including the seminar, must be part of one and the same field of specialisation.

<sup>4</sup> Students, who hold an ETH CSE Bachelor degree, can choose one of the following two alternatives:

- a. The five courses, including the seminar, are part of one and the same field of specialisation that was not attended during the ETH CSE Bachelor programme.
- b. Three courses, including the seminar, are part of the field of specialisation taken during the ETH CSE Bachelor programme; two courses are part of another field of specialisation.

<sup>5</sup> The following applies for students, who have attended courses from the fields of specialisation and already taken the relevant exams during the ETH CSE Bachelor programme:

- a. Students, who failed an exam once, can only have one attempt at the exam in the corresponding course in the CSE Master programme.
- b. Students, who failed an exam twice, cannot attend the corresponding course in the CSE Master programme.
- c. Students, who passed an exam, but did not use the corresponding credits to acquire their Bachelor degree, can have these credits recognised as follows to acquire the Master degree:
  1. in the category *Fields of Specialisation*, if the conditions in Para. 4 have been adhered to; or
  2. in the category *Electives*.

<sup>6</sup> Upon request in well-founded cases, the Director of Studies can approve attending courses other than those offered in the fields of specialisation.

## **Art. 30** Electives

<sup>1</sup> Students must take at least two electives. The following also applies:

- a. Courses from the category *Fields of Specialisation* can be recognised as an elective.
- b. Courses from the category *Core Courses and Compensatory Courses* cannot be recognised as an elective.
- c. Upon request, the Director of Studies can approve attending courses other than those offered as an elective. This is subject to the regulations in Lit. b.

<sup>2</sup> Each course in the category *Electives* is evaluated with an examination.

<sup>3</sup> The following applies for students, who have already taken exams in electives during the ETH CSE Bachelor programme:

- a. Students, who failed an exam once, can only have one attempt at the exam in the corresponding elective course in the CSE Master programme.
- b. Students, who failed an exam twice, cannot attend the corresponding elective course in the CSE Master programme.
- c. Students, who passed an exam, but did not use the corresponding credits to acquire their Bachelor degree, can have these credits recognised to acquire the Master degree.

### **Art. 31** Case Studies

<sup>1</sup> One course per semester is offered in the category *Case Studies*.

<sup>2</sup> At least two courses from the category *Case Studies* must be attended. The Director of Studies can approve exceptions in the case of a student exchange.

<sup>3</sup> The courses for this category involve carrying out a semester performance.

### **Art. 32** Semester Paper

<sup>1</sup> The semester paper is carried out on a topic from a core course or from a field of specialisation under the supervision of a lecturer. The Director of Studies can approve exceptions.

<sup>2</sup> The supervisor of the semester paper defines the task and determines the start and date of submission of the semester paper.

<sup>3</sup> The semester paper concludes with a written report and a presentation.

### **Art. 33** GESS Compulsory Electives

Each course in the category *GESS Compulsory Electives* is evaluated with a performance assessment. The department of ETH Zurich or the university offering the course specifies the type and the timing of the performance assessment.

#### **Art. 34** Master Thesis

<sup>1</sup> Only students, who fulfil the following criteria, are allowed to write up their Master thesis:

- a. They have successfully completed the Bachelor programme.
- b. They have fulfilled any additional requirements necessary to gain admission to the CSE Master programme.

<sup>2</sup> The Master thesis is supervised by a professor and is written over a period of five months. It is carried out on a topic from a core course or from a field of specialisation. The Director of Studies can approve exceptions.

<sup>3</sup> The Master thesis supervisor defines the task and determines the start and date of submission of the Master thesis.

<sup>4</sup> The Master thesis concludes with a written report.

#### **Art. 35** Results / Repeating Performance Assessments

<sup>1</sup> According to Art. 28 – 30 and Art. 33, a performance assessment in the categories *Core Courses and Compensatory Courses*, *Fields of Specialisation* (excluding the seminar), *Electives*, and *GESS Compulsory Electives* is considered as passed, if it is graded with at least 4 or with “passed”. A performance assessment considered as failed can be repeated once.

<sup>2</sup> The semester performances for the category *Case Studies* specified in Art. 31 are evaluated with “passed” or “failed”. A semester performance considered as failed cannot be repeated in which case another course from the category *Case Studies* must be attended.

<sup>3</sup> The seminar specified in Art. 29, Para. 1 and the semester paper specified in Art. 32 are evaluated with “passed” or “failed”. A seminar and/or a semester paper considered as failed cannot be repeated. Another seminar must be attended and/or another semester paper must be written up.

<sup>4</sup> The Master thesis specified in Art. 34 is graded. It is considered as passed, if it is graded with at least 4. A Master thesis considered as failed can be repeated once. If the Master thesis is repeated, a new topic must be treated.

## Chapter 5: Issuing the Master Degree

### Art. 36 Credits in each Category

<sup>1</sup> The 90 credits required to obtain a Master degree must be acquired in the following categories in the minimum number indicated for each category:

a.	Core Courses and Compensatory Courses	12	credits
	1. Core Courses (5 credits)		
	2. Compensatory Courses (0 credits)		
b.	Fields of Specialisation	18	credits
c.	Electives	6	credits
d.	Case Studies	6	credits
e.	Semester Paper	8	credits
f.	GESS Compulsory Electives	2	credits
g.	Master Thesis	30	credits
		<i>subtotal</i>	82 credits

<sup>2</sup> The sum of the minimum number of credits to be acquired in the categories according to Para. 1 is 82. A maximum of 4 credits can be recognised in the category *GESS Compulsory Electives*.

<sup>3</sup> At least 5 of the required 12 credits in the category *Core Courses and Compensatory Courses* must be acquired in the subcategory *Core Courses*.

<sup>4</sup> Credits for courses that are part of both Bachelor and Master programmes can only be recognised for the Master degree, if they have not already been recognised for the Bachelor degree.

### Art. 37 Request to Issue the Degree

<sup>1</sup> Within three years after having begun the Master programme, students can apply to be issued with the Master degree, once the requirements in Art. 36 have been fulfilled. Upon request, the Rector can extend this time limit for compelling reasons.

<sup>2</sup> The application should indicate the performance assessments passed from the categories specified in Art. 36, Para. 1 to be listed in the final academic record. The total number of credits for each category and subcategory must correspond to the minimum number of credits specified in Art. 36, Para. 1.

<sup>3</sup> A maximum of 100 credits are recognised for the Master degree. If requested by the student, additional credits are listed in the addendum to the final academic record.

**Art. 38** Interim Academic Record, Final Academic Record,  
Grade Point Average

<sup>1</sup> Interim academic records are generally issued at the end of the examination sessions and contain any study performances evaluated since the last interim academic record.

<sup>2</sup> The final academic record states:

- a. The grades and other performance evaluations in accordance with Art. 37, Para. 2, and the grade point average calculated from the grades.
- b. Additional performance evaluations and a core course that has not been passed (if any) are listed in the addendum to the final academic record in accordance with Art. 37, Para. 3.

<sup>3</sup> The grade point average in the final academic record (final grade) is calculated as a weighted mean of the following grades:

a. Grades: Core Courses	for each grade weighted	2
b. Grades: Compensatory Courses (if any)	for each grade weighted	1
b. Four grades: Fields of Specialisation	for each grade weighted	1
c. Grades: Electives	for each grade weighted	1
d. Master Thesis grade	grade weighted	4

<sup>4</sup> D-MATH/D-PHYS record, check and manage the grades and other performance evaluations, and issue the academic records.

**Art. 39** Certificate, Diploma Supplement, Publication

<sup>1</sup> Graduates, who obtain the Master degree, receive a certificate and a diploma supplement.

<sup>2</sup> The Rectorate publishes the names of Master degree graduates.

## Chapter 6: Final Regulations

### Art. 40 Exclusion from the Master Programme

Exclusion from the CSE Master programme generally results from not being able to acquire the required number of credits for the Master degree as indicated in Art. 36, due to

- a. having failed the performance assessments twice; or
- b. having exceeded the allowed maximum duration of study.

### Art. 41 Transcript of Records

Should a student be excluded from the CSE Master programme before acquiring the Master degree, or drop out of the study programme, he/she receives a transcript of records. This transcript lists all the evaluated study achievements carried out before being excluded from or dropping out of the programme.

### Art. 42 *abrogated*<sup>9</sup>

### Art. 43 Effective Date

These Programme Regulations come into effect at the beginning of the Winter Semester 2005/2006. These regulations are effective for students who begin the Master programme on or after this date.

On behalf of the ETH Zurich Executive Board

President: Kübler

Delegate: Kottusch

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<sup>9</sup> Art. 42 has been abrogated. The provisions for transferring from the CSE untiered diploma study programme to the CSE Master programme are no longer necessary.

## Appendix

to the 2005 Programme Regulations for the  
Master Programme in Computational Science and Engineering (CSE)

approved by the Rector on 24 May 2005

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### 1. Knowledge required to gain admission to the CSE Master programme (requirement profile)

(Ref: Art. 19, Para. 1, Lit. b of the Programme Regulations)

- 1.1 The CSE Master programme requires basic and subject-specific knowledge and abilities that are equivalent in content, scope and quality to the knowledge imparted during the ETH CSE Bachelor programme.

The scientific requirement profile defined in Item 1.3 must be fulfilled to gain admission to the programme. It serves as a guideline for applicants whose previous education does not come under Item 3 of this Appendix.

The requirement profile is based on knowledge and abilities imparted during the ETH CSE Bachelor programme and corresponds to a **total of 102 credits**. This also includes the relevant methodological, scientific way of thinking.

- 1.2 The Admissions Committee evaluates to what extent the applicants' previous education corresponds to the requirement profile (individual evaluation of dossiers). Any lack of knowledge and abilities must be compensated for by fulfilling additional requirements. The following also applies:

- a. Admission to the CSE Master programme is not granted, if the candidates are required to take additional courses:

- 1) amounting to more than 60 credits, or
- 2) from Part 1 of the requirement profile.

The Rector decides on any exceptions on the request of the Director of Studies.

- b. If the additional requirements are not completely fulfilled, admission to the CSE Master programme is revoked.

- 1.3 The **requirement profile** is divided into the following three parts:

#### Part 1 (22 credits)

Part 1 comprises 22 credits and includes basic knowledge of the fields of Mathematics and Computer Science taught during the first year of the CSE Bachelor programme. This knowledge constitutes a mandatory essential basis for the CSE Master programme. Courses previously attended by the applicants are evaluated according to the content of the courses listed below. Course details are listed in the ETH Zurich course catalogue ([www.courses.ethz.ch](http://www.courses.ethz.ch)).

- |                     |            |
|---------------------|------------|
| – Analysis I and II | 14 credits |
| – Linear Algebra    | 4 credits  |
| – Informatics I     | 4 credits  |

## Part 2 (60 credits)

Part 2 comprises 60 credits and consists of courses taught during the second and third years of the CSE Bachelor programme. This knowledge forms another mandatory essential basis for the CSE Master programme. Courses previously attended by the applicants are evaluated according to the content of the courses listed below. Course details are listed in the ETH Zurich course catalogue ([www.courses.ethz.ch](http://www.courses.ethz.ch)).

Minimum required knowledge:

- |  |            |
|--|------------|
| – Physics I and II   | 8 credits  |
| – Analysis III   | 4 credits  |
| – Programming Techniques   | 5 credits  |
| – Numerical Mathematics  | 7 credits  |
| – Stochastics  | 4 credits  |
| – Numerical Solution of Differential Equations   | 12 credits |
| – Software Design  | 6 credits  |
| – Two courses from a field of specialization <sup>10</sup>   | 6 credits  |
| – Written work or Bachelor thesis on a topic from a core course <sup>11</sup> or a field of specialization | 8 credits  |

## Part 3 (20 credits)

Part 3 comprises at least 20 credits from a list of 35 credits. This means that at least part of the course content listed below form another mandatory essential basis for the CSE Master programme. This course content is also taught during the second and third years of the CSE Bachelor programme. Course details are listed in the ETH Zurich course catalogue.

Partly required knowledge (at least 20 from 35 credits):

- |                                |           |
|--------------------------------|-----------|
| – Computer Engineering II      | 4 credits |
| – Information Systems          | 4 credits |
| – Parallel Numerical Computing | 6 credits |
| – Introduction to Optimization | 5 credits |
| – Fluid Dynamics for CSE       | 5 credits |
| – Chemistry for CSE            | 3 credits |
| – Statistical Physics          | 4 credits |
| – Quantum Mechanics            | 4 credits |

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<sup>10</sup> The fields of specialization are listed in the ETH Zurich course catalogue.

<sup>11</sup> The core courses are listed in the ETH Zurich course catalogue.

## **2. Direct enrolment for the CSE Master programme for students of the ETH CSE Bachelor programme**

(Ref: Art. 20, Para. 1 of the Programme Regulations)

Students following the ETH CSE Bachelor programme can directly enrol for the CSE Master programme when:

- a. they only need to acquire **a total of 30** credits to obtain the Bachelor degree, and
- b. the minimum required number of credits in the category *Basic Courses* (valid for Programme Regulations 2005) and/or in the categories *First Year Courses* and *Basic Courses* (valid for Programme Regulations 2008) of the Bachelor programme have been acquired for the Bachelor degree.<sup>12</sup> The permitted number of credits still to be acquired must be from other categories of the Bachelor programme.

## **3. University degrees qualifying for admission to the CSE Master programme without any further study requirements**

(Ref: Art. 21 of the Programme Regulations)

- 3.1** Persons holding the following Bachelor degree are admitted to the CSE Master programme without having to fulfil any further study requirements:
  - Bachelor of Science ETH in Computational Science and EngineeringDegrees from other universities are being clarified.
- 3.2** Applications from candidates holding another degree are evaluated individually in accordance with Art. 20, Para. 3 of the Programme Regulations.

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<sup>12</sup> See also the CSE Bachelor Programme Regulations 2005 and/or 2008.