Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

RSETHZ 324.1.0900.21

Programme Regulations 2014

of the Master's degree programme in

Physics

Department of Physics

28 January 2014

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

Version: **28.01.2014 – 0**

Programme Regulations 2014 of the Master's degree programme in Physics

Department of Physics

28 January 2014 (Version: 28 January 2014)

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, Subpara. a of the ETH Zurich Organisational Ordinance (*Organisationsverordnung ETH Zürich*) of 16 December 2003[1],

decrees:

Chapter 1: General regulations

Part 1: General

Art. 1 Subject and scope, Appendix

[1] These Programme Regulations set out the requirements according to which the Master's degree in Physics at the ETH Zurich Department of Physics (D-PHYS) 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-PHYS.

Art. 2 Academic title

[1] Graduates of the ETH Zurich Master's degree programme in Physics (degree programme) are awarded the academic title

Master of Science ETH in Physik
(abbreviation: MSc ETH Physik)

[2] The English form of this title is

Master of Science ETH in Physics
(abbreviation: MSc ETH Physics).

[3] This title may also be used in the abbreviated form "MSc ETH".

---

[1] 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[2] (ETH Zurich Ordinance on Performance Assessments)

b. Ordinance on Admission to Studying at ETH Zurich of 30 November 2010[3] (ETH Zurich Admissions Ordinance)

Art. 4 Course Catalogue

[1] D-PHYS lists the course units of the degree programme in the Course Catalogue. This list and its details are binding.

[2] The details of the entries in the Course Catalogue are set out in Art. 4 of the ETH Zurich Ordinance on Performance Assessments[4] and in the pertaining directives of the Rector.[5]

Part 2: Credit system

Art. 5 Policy

[1] The degree programme follows a credit system which is aligned with the European Credit Transfer System (ECTS).

[2] ETH Zurich deploys the ECTS in accordance with the Credit System Guidelines (*Richtlinien zum Kreditsystem*).[6]

Art. 6 Credits, basis for calculation

[1] ECTS credits describe the average student time expenditure required for an academic achievement.

[2] One credit corresponds to a workload of 30 hours. This workload comprises all of the academic activities required to obtain said credit.

[3] The curriculum is designed such that full-time students may obtain an average of 30 credits per semester.

---

[2] SR **414.135.1**, RSETHZ **322.021**
[3] SR **414.131.52**, RSETHZ **310.5**
[4] SR **414.135.1**, RSETHZ **322.021**
[5] See *www.directives.ethz.ch*
[6] See *www.directives.ethz.ch*

Art. 7 Allocation of credits to course units

[1] D-PHYS 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 disputes.

[3] If a course unit is offered by another university that university is responsible for allocating it 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 are 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 respective performance assessment was undertaken.

Art. 9 Recording, checking, administration

D-PHYS records, checks and administers the credits acquired.

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

Part 1: Programme content, scope and structure

Art. 10 Programme content

The Master's degree programme in Physics deepens the basic grounding acquired in the Bachelor's degree programme in Physics. In the Master's degree programme particular value is laid on flexibility and on learning via research in a research group. In addition to one or more specialised themes in physics or mathematics students select further courses from the ETH Zurich offering. Here they have the opportunity to become involved with further scientific disciplines at an advanced level according to talent and interest, e.g. via themes from biology, chemistry etc. The degree programme concludes with a Master's thesis in which students demonstrate their ability to conduct independent work in an area of theoretical or experimental physics. The Master's degree serves as a basis for doctoral work or entry to the labour market.

Art. 11 Programme progression, Study Guide

[1] Details on programme progression are provided in the degree programme Study Guide.

[2] The D-PHYS student advisor helps students to design a curriculum.

Art. 12 Scope, duration, limit on duration of studies

[1] To obtain the Master's degree, 90 credits are required as stipulated in Art. 30.

[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 a specified deadline.

[4] If admission to the degree programme is granted subject to the acquisition of additional credits the maximum permitted duration of studies may be extended by half a year for required extra credits in the range of 21 – 30. 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 pertaining Rector's directives.[7]

Art. 14 Admission to course units

Special admission prerequisites may apply to course units. These are set by that ETH department or the university which offers the respective course unit.

Art. 15 Student exchange (outgoing students)

[1] During the Master's degree programme credits may be earned at other universities (mobility credits). Of these mobility credits a maximum of 30 may be recognised towards the Master's degree, and of these 30 a maximum of 10 credits may be counted towards the category "core subjects". The stipulations of (3) and (4) below still apply.

[2] The following credits do not counts as mobility credits:

a. Credits from course units at other universities if these course units belong to the degree programme curriculum
b. Master's thesis credits

[3] Students who did not obtain the preceding (Bachelor's) degree at ETH Zurich

a. may not take part in an ETH Zurich exchange programme;
b. may undertake individual exchange stays, but no mobility credits may be recognised towards the Master's degree.

[4] If admission to the degree programme is subject to the acquisition of additional credits (admission with additional requirements) an exchange stay is only possible when the additional requirements have been completed. Nor do credits earned during an exchange count towards fulfilment of additional requirements.

[5] For an exchange stay the student first draws up a written study plan with the help of the departmental exchange coordinator D-PHYS. This plan includes the credits to be acquired at the host university. It must be approved by the Director of Studies.

[6] The Director of Studies then decides whether mobility credits will be recognised. Art. 16 of the ETH Zurich Ordinance on Performance Assessments[8] and the pertaining directives[9] of the Rector set out how proof of academic achievements should be handled.

---

[7] See *www.directives.ethz.ch*

[8] SR **414.135.1**, RSETHZ **322.021**

[9] See *www.directives.ethz.ch*

Part 2: Grouping by category

Art. 16 Categories

[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 subjects
   1) Theoretical core subjects
   2) Experimental core subjects

b. Electives
   1) Electives in Physics and Mathematics
   2) General electives

c. Proseminars and semester papers

d. Compulsory electives in the humanities, social and political sciences

e. Master's thesis

[2] D-PHYS assigns course units to the categories in Para. 1 and publishes them in the Course Catalogue.

[3] Details regarding additional courses (courses which are not required for the Master's degree) are set out in Art. 18. These courses are also listed in the Course Catalogue.

Art. 17 Overview of categories

[1] **Theoretical core subjects:** Theoretical core subjects address themes of theoretical physics at an advanced level. They extend the material covered in the Bachelor's degree programme and are the foundation for advanced training in theoretical physics. Details regarding performance assessments are provided in Art. 27.

[2] **Experimental core subjects:** Experimental core subjects address themes of experimental physics at an advanced level. They extend the material covered in the Bachelor's degree programme and are the foundation for advanced training in experimental physics. Details regarding performance assessments are provided in Art. 27.

[3] **Electives in Physics and Mathematins:** Electives in Physics allow students to deepen their knowledge of experimental and theoretical themes from physics. The topics addressed are usually those of current interest to research groups in D-PHYS and its associated units[10]. Electives in Mathematics allow students to deepen their knowledge of selected themes from mathematics, and come from the range of courses of the degree programme in Mathematics. Details regarding performance assessments are provided in Art. 27.

[10] "Associated units" are listed in the internal D-PHYS rules of procedure (*Geschäftsordnung*).

[4] **General electives:** General electives extend knowledge in areas of physics, mathematics and further scientific disciplines. Students may select courses from the entire ETH Zurich range, with the exception of courses from the first two years of an ETH Bachelor's degree curriculum and compulsory GESS elective courses, which are not recognised as general electives. On request, the Director of Studies may approve courses of other universities as general electives. Details regarding performance assessments are provided in Art. 27.

[5] **Proseminars and semester papers:** Proseminars involve individual work and deepen knowledge in an area of theoretical physics; an alternative is a theoretical semester paper. Students of experimental physics conduct experimental semester papers in a research group context. Details regarding performance assessments are provided in Art. 28.

[6] **Compulsory electives in humanities, social and political sciences:** Students are required to select general course units from the range of electives in humanities, social and political sciences (compulsory GESS electives). Further details are provided in the directives[11] regarding compulsory GESS electives, details regarding performance assessments in Art. 27 of these Programme Regulations.

[7] **Master's thesis:** The Master's thesis project concludes the degree programme and is normally conducted in the third semester of the degree programme. With the Master's thesis students demonstrate their ability to produce independent, structured scientific work. Further details are given in Art. 29.

Art. 18 Additional courses

[1] Additional courses comprise seminars, colloquia and supplementary subjects. They are not required for the Master's degree.

[2] Additional course seminars, colloquia and supplementary subjects offer additional knowledge which rounds off the range of courses. They are offered to students throughout their studies to stimulate their intellectual and physics-related curiosity and to expand their horizons.

[3] If the student undertakes performance assessments for an additional course the results will be listed on a separate page of the final academic record.

[11] See *www.directives.ethz.ch*

Chapter 3: Admission to the Master's degree programme

Art. 19 Prerequisites for admission

[1] Admission to the degree programme presupposes a university Bachelor's degree in Physics comprising at least 180 ECTS credits or an equivalent university degree in Physics or another qualifying discipline.

[2] Details of the academic and language prerequisites for admission (profile of requirements) are provided in the Appendix.

Art. 20 Registration / application, admission procedure and entry to the Master's degree programme

[1] Students of the Bachelor's degree programme in Physics already matriculated at ETH Zurich may enrol directly in the Master's degree programme.

[2] All other interested parties should apply to the ETH Zurich Academic Services for admission to the degree programme.

[3] The admissions committee of the degree programme investigates candidates' academic backgrounds and suitability for the Master's degree programme. The Chair of the admissions committee[12] formulates a request for admission or rejection for the attention of the Rector.

[4] The Rector decides whether to admit or reject the candidate on the basis of the recommendation of the Chair of the admissions committee.

[5] The Rector may, depending on the candidate's qualifications and previous knowledge, make admission conditional upon the acquisition of additional knowledge and skills during the Master's degree programme (admission with additional requirements).

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

[12] The Chair of the admissions committee must always be an ETH Zurich professor.

Chapter 4: Performance assessments

Part 1: General regulations

Art. 21 Performance evaluation

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

Art. 22 Admission to performance assessments

Conditions may apply to admission to performance assessments. These are determined by the department at ETH Zurich or by the university which offers the course unit.

Art. 23 Registering/deregistering for performance assessments

[1] The following applies 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 ETH Zurich Ordinance on Performance Assessments[13] and the directives of the Rector [14].

b. If the performance assessments fall into another category, registration and deregistration are generally 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.

Art. 24 Absence, interruption, breaking off, late submission or non-submission

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

a. ETH Zurich performance assessments are governed by the stipulations of ETH Zurich Ordinance on Performance Assessments[15] and the pertaining directives of the Rector [16].

b. Performance assessments of another university are subject to the rules of that university.

---

[13] SR **414.135.1**, RSETHZ **322.021**

[14] See *www.directives.ethz.ch*

[15] SR **414.135.1**, RSETHZ **322.021**

[16] See *www.directives.ethz.ch*

Art. 25 Issuing of results, disputes

[1] Students may view all of their performance results on the internet via the corresponding ETH Zurich application. They are informed periodically by email as to which performance assessment results are now viewable.

[2] Every communication explains the procedure to follow if new results are disputed.

Art. 26 Dishonest conduct

The sanctions for dishonest conduct in the context of performance assessments is outlined in the Disciplinary Code of ETH Zurich (*Disziplinarordnung ETH Zürich*) of 2 November 2004[17].

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

Art. 27 Core subjects, electives, compulsory GESS electives

[1] Every course unit in the categories "core subjects", "electives" and "compulsory GESS electives" is subject to a performance assessment.

[2] The respective modalities of each performance assessment are listed in the Course Catalogue if the course unit is offered by ETH Zurich.

[3] If a course unit is offered by another university that university determines the modalities of the respective performance assessment.

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

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

Art. 28 Proseminars and semester papers

[1] Every course unit in the category "proseminars and semester papers" is subject to a performance assessment.

[2] The respective modalities of performance assessment are listed in the Course Catalogue.

[3] Proseminars and semester papers are graded on a pass/fail basis.

---

[17] SR **414.138.1**, RSETHZ **361.1**

[4] A failed proseminar or semester paper may not be repeated. Students must complete a different proseminar or semester paper to obtain the required credits.

Art. 29 Master's thesis

[1] Students are only permitted to commence the Master's thesis if

a. the Bachelor's degree programme has been completed,
b. any additional requirements for admission to the degree programme have been fulfilled, and
c. the required 8 credits in the category "proseminars and semester papers" of the Master's degree programme have been acquired (see Art. 30, Para. 1, Subpara. c).

[2] The Master's thesis is supervised by a professor from D-PHYS or an associated member of D-PHYS. D-PHYS may designate further persons who are authorized to supervise Master's theses.

[3] The Master's thesis addresses an area of a core subject or of an elective (physics, mathematics or general). In consultation with the student the Master's thesis supervisor defines the task and sets the project's starting date and submission deadline. The Director of Studies may, on request, approve exceptions.

[4] The deadline for submitting the Master's thesis is six months after the starting date. The Director of Studies may extend the deadline if cogent grounds are given. If the Christmas holidays fall during the Master's thesis period the deadline will automatically be extended by ten days.

[5] The Master's thesis is awarded a grade. It is passed if this grade is at least a 4.

[6] A failed Master's thesis project may only be repeated once. If it is repeated, a new theme must be addressed. The repetition may be conducted under a new supervisor.

Chapter 5: Issuing of the Master's degree

Part 1: Credits by category and degree request

Art. 30 Credits by category

[1] The 90 credits required for the Master's degree must be earned in the following categories and sub-categories in at least the numbers given. Further details are set out in Para. 2 – 4.

a.	Core subjects	30 credits
	1) Theoretical core subjects (at least 10 credits)	
	2) Experimental core subjects (at least 10 credits)	
b.	Electives	20 credits
	1) Electives in Physics and Mathematics (at least 10 credits)	
	2) General electives	
c.	Proseminars and semester papers	8 credits
d.	Compulsory GESS electives	2 credits
e.	Master's thesis	30 credits

[2] At least 30 credits must be earned in the category "core subjects" as per Para. 1 (a). Of these at least 10 must come from the subcategory "theoretical core subjects" and at least 10 from "experimental core subjects".

[3] At least 20 credits must be earned in the category "electives" as per Para. 1 (b). Of these at least 10 must come from the subcategory "electives in Physics and Mathematics".

[4] Credits from core subjects may also be recognised towards the category "electives in Physics and Mathematics" as per Para. 1 (b) (1).

Art. 31 Degree request

[1] When they have fulfilled the requirements set out in Art. 30 students may request the issue of the Master's degree. This request must be submitted within three years of commencing the Master's degree programme. The Rector may extend this deadline if cogent grounds are provided by the respective request deadline.

[2] The request should contain all those performance achievements with pass grades in the categories and sub-categories listed in Art. 30 which are to be listed in the final academic record. The sum of credits in each category must reach the minimums designated in Art. 30.

[3] The credits earned by completing a course unit may not be recognised more than once, or divided up.

[4] A maximum of 30 mobility credits may be recognised towards the Master's degree. The stipulations of Art. 15 apply.

[5] A maximum of 100 credits may be recognised towards the Master's degree.

[6] Credits from additional courses as per Art. 18 (seminars, colloquia and supplementary subjects) are not recognised towards the Master's degree. They are listed on a separate sheet of the final academic record.

[7] Recognition of study achievements or credits from preceding studies is not possible. Exceptions are listed in Para. 8.

[8] Credits earned at ETH Zurich may be recognised as long as the knowledge and skills acquired thereby are integral to the degree programme and the credits in question have not already been recognised towards a degree. The Director of Studies decides whether credits will be recognised. There is no automatic entitle-ment to recognition.

Part 2: Academic record, degree certificate and Diploma Supplement

Art. 32 Documents

Graduates of the degree programme receive three documents: an academic record, a degree certificate and a Diploma Supplement.

Art. 33 Academic record

[1] The academic record verifies the successful completion of the Master's degree.

[2] The academic record lists

a. The study achievements listed in the degree request as per Art. 31, including grades and other measures of performance.
b. The final grade, computed as the weighted average of all the grades listed in the degree request. Weighting corresponds to the number of credits allocated to the individual courses. Any grades from compulsory GESS electives are not taken into account in the grade point average.

[3] A separate sheet of the academic record lists

a. Any additional admission requirements.
b. Any study achievements from additional courses as per Art. 18.
c. All further study achievements as set out in the pertaining directives[18] of the Rector.

[4] D-PHYS records, checks and administers the grades and other measures of performance, and issues the academic records.

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[19].

[2] The Diploma Supplement comprises a standardised explanation of the degree.

---

[18] See *www.directives.ethz.ch*

[19] SR **414.135.1**, RSETHZ **322.021**

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 according to the stipulations of Art. 30, or any other conditions) can no longer be satisfied due to failure of performance assessments or failure to respect academic deadlines[20].
b. If admission was subject to 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.

Art. 36 Transcript of records after exclusion or abandonment of studies

Students who are excluded from the degree programme or withdraw from it before obtaining the Master's degree receive a transcript of records for non-graduating students which lists all the study achievements generated and evaluated before exclusion or withdrawal.

Art. 37 Special cases

The Director of Studies rules on cases which are not or are not sufficiently addressed by these Programme Regulations, their appendix, or other relevant ordinances and directives.

Art. 38 Entry into effect

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

[2] They apply to students who

a. enter or re-enter this degree programme from Autumn Semester 2014 onwards, or
b. entered this degree programme before Autumn Semester 2014 and wish to complete the Master's degree according to these Programme Regulations 2014 (an official transfer is required).

On behalf of the Executive Board
President: Ralph Eichler
Secretary General: Hugo Bretscher

[20] Academic deadlines are deadlines for conducting performance assessments, additional individual deadlines, and the maximum permitted duration of studies.

Appendix

To the Programme Regulations 2014 of the
Master's degree programme in Physics

31 August 2010 (Version: 01 October 2020)

Applies to students who commence or re-enter the degree programme in Autumn Semester 2021 or later.

This English translation is for information purposes only. The German version is the legally binding document.

Subject and scope

This appendix sets out the academic, language and performance prerequisites for and further details regarding admission to the Master's degree programme in Physics. 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 Physics (subsequently 'the degree programme') all of the following prerequisites must be satisfied.

1.1 Degree qualifications

[1] Admission to the degree programme presupposes a university Bachelor's degree comprising at least 180 ETCS([1] credits or an equivalent university degree in a discipline the content of which – also with regard to any additional academic requirements within the given framework – satisfies the pertaining academic prerequisites.

[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.

1.2 Academic prerequisites

[1] Attendance of the Master's degree programme in Physics presupposes basic knowledge and skills in the disciplines of Mathematics and Physics which must in content, scope, quality and skill level be equivalent to those covered at ETH Zurich (discipline requirements profile).

[2] The **discipline requirements profile** is based on knowledge and skills covered in the ETH Bachelor's degree programme in Physics, including the corresponding methodological scientific thinking skills. Details are set out in Para. 5 below.

[3] If an applicant does not completely satisfy the academic prerequisites, admission may be subject to the acquisition of the missing knowledge and skills in the form of additional requirements. Completion of additional requirements is expressed in credits. For further details, see Section 4 below.

---

[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.

[4] Admission to the degree programme is not possible if the academic gaps in the candidate's background are too extensive. For further details, see the Sections below.

[5] The **discipline requirements profile** is structured in two parts set out below. Details regarding the content of the corresponding course units are published in the ETH Course Catalogue (www.courses.ethz.ch).

Part 1: Basic knowledge and skills

Part 1 covers basic knowledge from the disciplines Mathematics and Physics. The substance of the following course units is required:

1a ***Mathematics***

- Analysis I
- Analysis II
- Linear Algebra I
- Linear Algebra II
- Numerical Methods
- Computer Science
- Complex Analysis [Funktionentheorie]
- Methods of Mathematical Physics I
- Methods of Mathematical Physics II

1b ***Physics***

- Mechanics and Heat [Mechanik und Wärme]
- Oscillations and Waves [Schwingungen und Wellen]
- Electricity and Magnetism [Elektrizität und Magnetismus]
- Quantum Physics [Quantenphysik]

1c ***Practicals, proseminars, semester theses***

- Physics practicals
- Semester thesis projects (experimental or theoretical) and proseminars

Part 2: Subject-specific knowledge and skills

Part 2 covers specific knowledge in the disciplines of Physics. The substance of the following course units is required:

A) ***Theoretical Physics***

- General Mechanics [Allgemeine Mechanik]
- Electrodynamics [Elektrodynamik]
- Quantum Mechanics I
- * Quantum Mechanics II
- * Theory of Heat [Theorie der Wärme]
- * Continuum Mechanics [Kontinuumsmechanik]

B) ***Core subjects of Experimental Physics***

- * Astrophysics
- * Solid State Physics [Festkörperphysik]
- * Nuclear and Particle Physics [Kern- und Teilchenphysik]
- * Quantum Electronics [Quantenelektronik]

From the course unit groups marked with an asterisk (*) the content of at least four course units is required, of which at least one must belong to Theoretical Physics and at least two must belong to the core subjects of Experimental Physics.

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[2]) must be provided.

[3] The required language certificates must be submitted by the application deadline. The ETH Zurich publishes a list of the language certificates accepted.

[2] The required language level is measured according to the Common European Framework of Reference for Languages scale (CEFR)

2 Specific stipulations for admission and entering the degree programme

2.1 Specific stipulations for admission to the degree programme

2.1.1 Candidates with a Bachelor's degree in Physics from ETH Zurich

Unconditional admission

The following persons are guaranteed unconditional admission to the degree programme:

a. Holders of a Bachelor's degree in Physics from ETH Zurich
b. Students enrolled in the ETH Zurich Bachelor's degree programme in Physics

2.1.2 Candidates with a Bachelor's degree in Physics from another Swiss university

Admission

[1] Admission to the degree programme is guaranteed for those holding a Bachelor's degree in Physics from another Swiss university than ETH Zurich.

[2] Admission is subject to fulfilment of the language prerequisites set out in section 1.3 above.

[3] Admission may be subject to additional requirements.

2.1.3 Candidates with a Bachelor's degree in Physics from a university outside Switzerland

[1] Holders of a Bachelor's degree or the equivalent in Physics from a university outside Switzerland must satisfy all of the academic and language prerequisites listed in Section 1.2 and 1.3 above for admission to the degree programme.

[2] Admission may be subject to additional requirements.

[3] Admission is not possible if any of the following apply

a. the language prerequisites are not satisfied
b. the content, scope, quality and skill level of the degree are not equivalent to those at ETH Zurich
c. the number of additional credits required to satisfy the academic prerequisites (listed in Section 1.2 above) exceeds 30 credits in total.

2.1.4 Candidates with a university Bachelor's degree in a discipline other than Physics

[1] Holders of a university Bachelor's degree or the equivalent in a discipline other than Physics may be admitted to the degree programme if they can satisfy all of the following prerequisites

a. the academic requirements set out in Section 1.2 above are satisfied within the given framework
b. the language prerequisites set out in Section 1.3 above are satisfied
c. a very good academic performance during the Bachelor's degree studies

[2] Admission may be subject to additional requirements.

[3] Admission is not possible if any of the following apply

a. the language or performance prerequisites are not satisfied
b. the content, scope, quality and skill level of the degree are not equivalent to those at ETH Zurich
c. the number of additional credits required to satisfy the academic prerequisites (listed in Section 1.2 above) exceeds
    1. 30 credits in total, or
    2. 15 credits from Part 1 of the academic prerequisites

2.2 Specific stipulations for entering the degree programme

2.2.1 Candidates with an ETH Bachelor's degree in Physics

Students of the ETH Zurich Bachelor's degree programme in Physics may enrol in the degree programme directly via *www.mystudies.ethz.ch*. The admission procedure outlined in Section 3 is waived. Further details:

a. The normal ETH enrolment dates and deadlines apply.
b. Enrolment is possible as soon as
    1. a maximum of 62 credits from the Bachelor's degree programme are pending; and
    2. the first-year examinations, Examination Blocks I and II, both Beginners Practicals, and Advanced Practical 1 have been passed.
c. 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.

2.2.2 Candidates with an ETH Bachelor's degree in a discipline other than Physics

The following stipulations regarding entry to the Master's degree programme apply to students from an ETH Zurich Bachelor's degree programme (other than Physics) who have been granted admission:

a. The normal ETH enrolment dates and deadlines apply.
b. They 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.[3]
c. 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.

2.2.3 Candidates with a Bachelor's degree from another university

Non-ETH graduates who have been granted admission may only begin the degree programme when they have completed the previous (Bachelor's) degree programme.

3 Application and admission procedure

[1] All candidates – with the exception of matriculated ETH Zurich students from the Bachelor's degree programme in Physics – must submit an application for admission to the degree programme. The binding specifications for application, in particular the documents required and the submission dates/deadlines, 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] Applications will not be considered if

a. they are submitted late or not in the correct form, *or*
b. the relevant fees have not been paid.

[4] 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.

[5] On the request of the Director of Studies the Rector makes the final decision regarding admission or rejection.

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

[3] The permitted number of missing credits is set out in the Programme Regulations of the respective consecutive Master's degree programme (e.g., BSc Materials Science → MSc Materials Science).

4 Fulfilling additional admission requirements

4.1 General regulations

[1] Candidates who are admitted subject to the fulfilment of additional requirements must acquire the required additional knowledge and skills before or during the Master's degree 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 she/he will be regarded as having failed the programme and will be excluded from it.

[3] The deadlines and conditions for undergoing said performance assessments are set out in Section 4.2 below.

4.2 Performance assessment deadlines and conditions

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

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

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

Appendix 2

To the Programme Regulations 2014 of the
Master’s degree programme in Physics

Qualification profile

Introduction

The Master’s degree programme in Physics consolidates the fundamental knowledge acquired during the Bachelor’s degree programme. With a broad choice of courses and a large freedom to organize their studies themselves, graduates of the Master’s degree programme have followed their inclination for an in-depth and diverse scientific education. Graduates have been actively involved in current research and are experienced in modern research methods. Moreover, they have acquired the knowledge, competences, and general skills to assume leading positions in industry and public service. The Master’s degree qualifies graduates to pursue doctoral studies.

Domain-specific knowledge and understanding

Graduates with a Master’s degree in Physics have

- a sound knowledge and understanding of a wide range of basic fields in Physics;
- through advanced studies, gained deeper insight into topics of their choice;
- an in-depth knowledge of advanced methods in their area of specialization by conducting extensive work on a current research topic.

Skills

a) Analytical skills

Graduates with a Master’s degree in Physics

- can apply common scientific methods and models to investigate complex problems in a wide range of scientific topics;
- can interpret and analyse results in their field and put them into context;
- can evaluate and adapt theoretical models and experimental setups to investigate and describe physical phenomena.

b) Development skills

Graduates with a Master’s degree in Physics

- can solve open-ended problems by applying theoretical and experimental methods and skills acquired in the course of their studies;
- can independently acquire knowledge outside their area of specialization and transfer knowledge as well as scientific methods from one context to another;
- have the ability to realistically transform general problems of physical nature (which may or may not be structured) into a physical model and to analyse this model with the methods of physics and mathematics.

Personal and social competences

Graduates with a Master’s degree in Physics

- are able to contribute constructively to the projects of a diverse research team;
- can articulate their beliefs and thoughts on scientific subjects, appreciate the positions of others and revisit their own positions based on new insights;
- can actively participate in a scientific discourse (i.e. research literature, colloquia, presentations, etc.) on a specific area of physics and present positions based on scientific arguments.

Appendix 3

To the Programme Regulations 2014 of the
Master's degree programme in Physics

3 March 2017 (Version: 3 March 2017)

Applies to students who commence the direct doctorate programme in Autumn Semester 2018 or later.

This English translation is for information purposes only. The original German version is the legally binding document.

Direct doctorate programme

(Ref.: Art. 10a of the Programme Regulations)

Art. 1 Subject and scope

This appendix sets out the policies which govern the direct doctorate programme in Physics (direct doctorate programme) at the ETH Zurich department of Physics (D-PHYS).

Art. 2 Objective

The direct doctorate programme enables candidates with an outstanding university Bachelor's degree to commence doctoral studies directly.

Art. 3 General

The modalities of the direct doctorate programme are based upon the Rector's Directive on the direct doctorate programme of 1 November 2016[1] and further relevant ETH Zurich enactments: the Ordinance on Doctoral Studies ETH Zurich of 1 July 2008[2], the ETH Zurich Admissions Ordinance of 30 November 2010[3] and the ETH Zurich Ordinance on Performance Assessments of 22 May 2012[4].

Art. 4 Components of the direct doctorate programme

The direct doctorate programme is composed of two parts. The first comprises a complete Master's degree programme in Physics according to Art. 8 of this appendix, and the second actual doctoral studies.

---

[1] See *www.directives.ethz.ch*

[2] RSETHZ **340.31en**, SR **414.133.1**,

[3] SR **414.131.52**, RSETHZ **310.5**

[4] SR **414.135.1**, RSETHZ **322.021**

Art. 5 Application

[1] Holders of a Bachelor's degree from ETH Zurich or another university or a degree recognised by ETH Zurich as equivalent which demonstrates outstanding academic performance may apply for admission to the direct doctorate programme. The respective degree must be in one of the disciplines which qualify the holder to pursue the Master's degree programme in Physics.

[2] Application for the direct doctorate programme is always associated with the D-PHYS Master's degree programme in Physics. Application proceeds online via the application portal for Master's degree studies.

[3] Application for the direct doctorate programme is also subject to the following:

a. The same binding stipulations which govern application for the Master's degree programme in Physics also apply to the direct doctorate programme, particularly those regarding dates, deadlines and documents to be submitted.

b. In addition to the documents mentioned in (a), the following must be submitted with the application: a written statement from a member of D-PHYS that he/she agrees to supervise the doctoral thesis. This person must be qualified to supervise doctoral theses according to the provisions of Art. 6 of the Ordinance on Doctoral Studies ETH Zurich[5] and the associated implementation stipulations[6] of the Rector.

c. Application may proceed even if the required Bachelor's degree has not yet been issued. Entry to the direct doctorate programme may not proceed, however, until Bachelor's degree studies have been completed.

Art. 6 Admission

[1] Admission to the direct doctorate programme is only possible if all of the following conditions are met:

a. Official proof of qualifications as per Art. 5, Para. 2 (f) of the Ordinance on Doctoral Studies ETH Zurich[7] have been supplied, with the proviso that the direct doctorate programme includes a Master's degree programme in Physics according to the provisions of Art. 8 of this appendix.

b. All of the admission prerequisites of the D-PHYS Master's degree programme in Physics have been met and allow admission to the Master's degree programme in Physics with no additional requirements. The appraisal of applications is conducted according to the normal procedure through the Academic Services Admissions Office and the admissions committee of the Master's degree programme in Physics.

c. The doctoral committee of D-PHYS endorses any admissions to the direct doctorate programme.

d. A written agreement to supervise the doctoral thesis as per Art. 5, Para. 3 (b) has been received.

---

[5] SR **414.133.1**

[6] RSETHZ **340.311**

[7] RSETHZ **340.31en** (SR **414.133.1)**

[2] If the admission requirements of (1) are fulfilled, D-PHYS submits a request for admission to the direct doctorate programme to the Rector (represented by the Vice-Rector for Doctoral Studies).

[3] Admission to the direct doctorate programme comprises:

a. Admission to the Master's degree programme in Physics with no additional requirements

b. Provisional admission to doctoral studies as per Art. 7 (a) of the Ordinance on Doctoral Studies ETH Zurich[8]

[4] Completion of the Master's degree programme in Physics according to the provisions of Art. 8 of this appendix replaces the additional admission requirements described in Art. 10 of the Ordinance on Doctoral Studies ETH Zurich[9].

Art. 7 Matriculation

Students pursuing the direct doctorate programme have two matriculations at ETH Zurich: they are matriculated as both Master's degree and doctoral students. The Master's degree matriculation ends when the Master's degree programme is completed.

Art. 8 Master's degree programme: Policy

[1] Students in the direct doctorate programme complete the D-PHYS Master's degree programme in Physics and acquire the Master's degree in Physics. Even during the Master's degree programme they are supervised by the doctoral thesis supervisor (see Art. 5, Para. 3 (b)).

[2] To complete the Master's degree in Physics in the framework of the direct doctorate programme, students must

a. adhere to the stipulations of the Programme Regulations 2014 of the Master's degree programme in Physics[10];

b. complete the additional provisions set out in Art. 9 of this appendix; the additional provisions may differ from the stipulations of the Programme Regulations 2014.

[3] D-PHYS is responsible for checking adherence to the requirements set out in Para. 2 above.

[8] RSETHZ **340.31en** (SR **414.133.1)**
[9] RSETHZ **340.31en** (SR **414.133.1)**
[10] RSETHZ **324.1.0900.21**

Art. 9 Master's degree programme: Additional requirements

The additional provisions mentioned in Art. 8, Para. 2 (b) are the following:

a. Students must acquire at least 44 credits within the first two semesters of commencing studies. These 44 credits must stem from the following course unit categories:
    1. Three core subjects from the Master's degree programme (at least 30 credits). Core subjects from the Bachelor's degree level are not considered here
    2. A semester paper or proseminar (at least 8 credits)
    3. An elective (at least 6 credits). Electives may include core subjects from the Bachelor's degree level

b. An average grade of at least 5.25 must be achieved in the three core subjects mentioned in (a)(1). The average grade is computed as the weighted average of the respective grades with the number of credits as the weighting value.

c. The Master's thesis is governed by the provisions of Art. 29 of the Programme Regulations 2014 of the Master's degree programme in Physics[11]. The Master's thesis may not be substituted by other research papers.

d. The Master's degree must be acquired within four semesters of commencing studies. This deadline may be extended by the doctoral committee if a substantiated request is submitted.

Art. 10 Degree request

[1] Students must submit the degree request as soon as they have fulfilled all the academic requirements for the Master's degree as listed in Art. 8 and 9 of this appendix.

[2] Completion of the Master's degree programme is verified with the usual documents (academic record, degree certificate and Diploma Supplement).

Art. 11 Definitive admission to doctoral studies

Definitive admission to doctoral studies proceeds when all of the following apply:

a. Master's degree studies have been completed.

b. The additional requirements according to Art. 9 of this appendix have been fulfilled.

c. All further admission requirements as per Art. 12 of the Ordinance on Doctoral Studies ETH Zurich[12] have been fulfilled.

[11] RSETHZ **324.1.0900.21**

[12] RSETHZ **340.31en** (SR **414.133.1)**

Art. 12 Maximum permitted duration of doctoral studies

[1] The doctoral examination must be undertaken six years after admission to the direct doctorate programme or provisional admission to doctoral studies at the latest. Students in the direct doctorate programme may, pursuant to Art. 27, Para. 4 of the Ordinance on Doctoral Studies ETH Zurich[13], extend this deadline by one year.

[2] Despite the right to this one-off extension it is not automatic, but requires a request.

Art. 13 Exclusion from the direct doctorate programme

[1] Exclusion from the direct doctorate programme proceeds in the following cases:

a. The requirements for obtaining the Master's degree in Physics (required number of credits, any other requirements) can no longer be fulfilled.
b. The additional requirements as per Art. 9 of this appendix can no longer be fulfilled.

[2] Exclusion as mentioned in Para. 1 (a) constitutes simultaneous exclusion from the Master's degree programme in Physics, because the latter counts as definitively failed.

[3] The Master's degree programme in Physics may be continued after exclusion according to Para. 1 (b). The additional requirements as per Art. 9 of this appendix are then no longer relevant to acquiring the Master's degree. Renewed application for doctoral studies is possible after successful completion of Master's degree studies.

[4] The provisions of Art. 13b, 13c and 13d of the Ordinance on Doctoral Studies ETH Zurich[14] also apply.

Art. 14 Withdrawal of agreement to supervise the doctoral thesis

If the supervisor withdraws his/her agreement to supervise the doctoral thesis, the provisions of Art. 17 – 20 of the Ordinance on Doctoral Studies ETH Zurich[15] apply.

Art. 15 Funding, tuition fees waiver and doctoral studies fees

[1] Students in the direct doctorate programme receive a merit-based scholarship for the duration of the Master's degree programme. The respective amount corresponds to the funds required of foreign students by the Migration Office of the Canton of Zurich to cover tuition and living costs.[16]

---

[13] RSETHZ **340.31en** (SR **414.133.1)**
[14] RSETHZ **340.31en** (SR **414.133.1)**
[15] RSETHZ **340.31en** (SR **414.133.1)**
[16] At the time this appendix entered into effect: CHF 21,000.00 per year

[2] The doctoral thesis supervisor (see Art. 5, Para. 3 [b]) is responsible for financing the merit-based scholarship mentioned in Para. 1. The scholarship is paid out each semester by the Financial Aid Office.

[3] Students in the direct doctorate programme are not subject to tuition fees for the duration of the Master's degree programme.

[4] Students may work as Teaching Assistants (Hilfsassistent/in*)* while drawing the merit-based scholarship.

[5] Exclusion from the direct doctorate programme means loss of the merit-based scholarship and cessation of the tuition fees waiver.

[6] After Master's studies are completed the student is employed as a doctoral student according to the conditions usual in D-PHYS.

[7] Doctoral fees as per Art. 33 of the Ordinance on Doctoral Studies ETH Zurich([17] cannot be waived.

[8] Any deviations from the stipulations in Para. 1 and 2 are subject to the Rector's approval.

[17] RSETHZ **340.31en** (SR **414.133.1)**