

Study Guide

MSc in Physics

DEAR MSC PHYSICS STUDENTS,

Welcome to the Master of Science in Physics at ETH Zurich. We are very pleased that you chose to expand your knowledge of Physics with us. This Master programme is an opportunity for you to reach out to more advanced topics and turn your focus towards the disciplines in Physics which you find most fascinating. We are proud of the broad spectrum of Physics provided by our department which is reflected in the strong research units of our institutes.

Particle Physics explores the elementary building blocks of matter and their interactions. Research in Astrophysics covers the range from solar physics and planets to the evolution of the universe. Fundamental Quantum Physics and its potential applications are at the centre of research in Quantum Electronics. Condensed Matter Physics investigates quantum materials and develops novel devices for modern information technologies. Finally, Theoretical Physics pursues the mathematical description of nature, essentially covering the full range of subjects represented in the experimental institutes and beyond.

This gives you ample opportunity to reach the boundaries of actual research. You will then focus on your most favourite field and push beyond the edge of current knowledge during your Master's thesis.

This study guide shall facilitate the important choices you have to take during your Master studies and will help you cope with important administrative steps.

We wish you an exciting and successful journey throughout your study of Physics, keeping in mind: great challenges also harbour great opportunities.



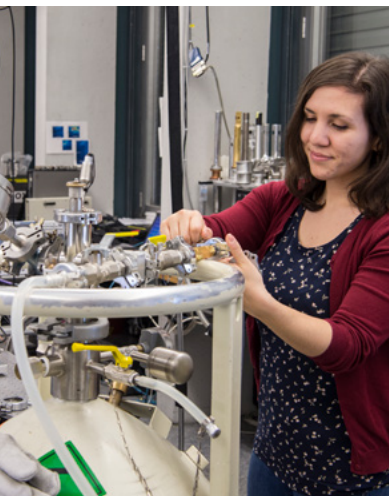
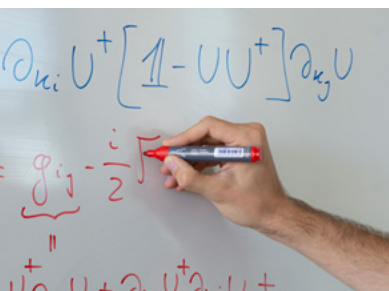
Director of Studies

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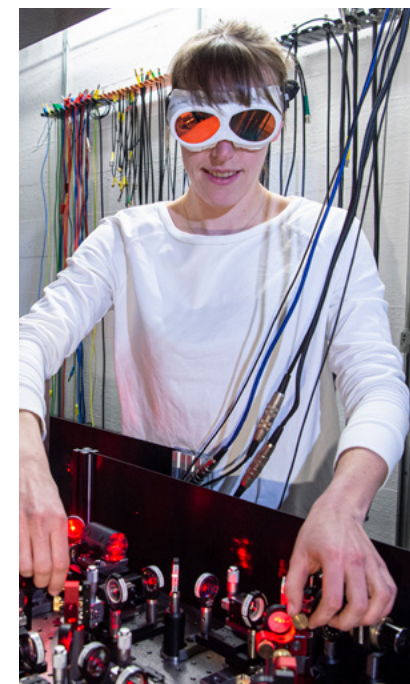
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1 INTRODUCTION

This study guide for the MSc programme in Physics should help you finding your way through your studies. Besides offering a comprehensive summary of the regulations we also provide you with information about different points of contact within our department and ETH Zurich.

Please do not hesitate contacting the study administration → studiensekretariat@phys.ethz.ch if any questions remain after reading this document.

1.1 Regulations

The legal basis for this study guide and the MSc programme in Physics at ETH Zurich is the "Programme Regulations 2014 of the Master's degree programme in Physics, Department of Physics"¹. The details for all the courses and performance assessments are individually regulated in the course catalogue → www.vvz.ethz.ch.

1.2 Admission

The admission criteria to the MSc studies in Physics are either a BSc degree in Physics from ETH or the completion of an equivalent curriculum at ETH or at a comparable Higher-Education institution.

Please also note: An admission to the MSc programme in Physics does not include any financial support.

1.2.1 Consecutive Study

Students enrolled in the study programme BSc in Physics can matriculate for the MSc programme in Physics via myStudies as soon as they have earned 118 credit points (CPs) and have passed the first-year examinations (Basisprüfung), examination blocks I and II and the first three lab courses. Admission remains provisional until the Bachelor's degree is issued. Admission will be revoked if the BSc degree cannot be issued.

Students may start their studies either in the Autumn or Spring Semester.

1.2.2 BSc degree in another Discipline or from a Foreign University

Students who do not have a BSc in Physics from ETH Zürich have to apply via the admissions office. The prerequisites for admission are:

A university BSc degree in Physics or in a discipline whose content covers the academic prerequisites² of the programme, comprising at least 180 ECTS³ credits.

You can find all the necessary information about the application procedure on the admissions office website → [Master application](#).

1.2.3 Application periods

Students from Universities outside of the EU/EFTA Countries have to apply during the international application period in November. This is especially important if a visa is necessary for entering Switzerland. Additionally, the application for the ESOP-Scholarship (see section 7.5, "Financial") is only possible during this application period.

An application during the EU/EFTA-application period in March is also possible for students applying from within the EU/EFTA Countries and Switzerland. For details please check the application-schedule website of the admissions office → [Application schedule](#).

Start of the programme for non-Physics or non-ETH BSc Physics students is only possible in the Autumn Semester.

1.2.4 Direct Doctorate

Exceptionally qualified students can directly apply for a PhD position within the direct doctorate programme. For a successful application, the confirmation of the future supervisor and an outstanding academic record are required in addition to the regular MSc application.

The programme consists of two parts: The first part comprises a complete MSc programme in Physics and the second part encompasses the actual doctoral studies. During the MSc studies, you receive a full merit-based scholarship and the tuition fees are waived. During the doctoral studies a salary according to the Ordinance for Scientific Employees of ETH⁴ is paid.

The direct doctorate programme implies additional requirements. Students have to

- › earn a minimum of 44 CPs within two semesters, including three core courses⁵ (30 CPs), a semester project or proseminar (8 CPs) and at least one elective course (6 CPs);
- › achieve a minimal grade average of 5.25 in the three core courses;
- › conclude and request the MSc degree within 2 years after starting the programme.

² Check the appendix of the programme regulations.

³ European Credit Transfer System, one credit corresponds to 25-30 hours of work. See [directive \(in German\)](#).

⁴ in German, see RST 172.220.113.11

⁵ Only core courses at MSc level are allowed.

If these requirements are not fulfilled, students would drop out of the direct doctorate programme and lose the funding. However, students can finish the MSc degree according to the regulations.

The details regarding the direct doctorate are regulated in a directive⁶ of the rector and the appendix of the MSc degree regulations.

1.3 Language of Instruction in Courses and Examinations⁷

The language of instruction of the course units and the corresponding performance assessments in the MSc programme in Physics is mainly English and it is announced in the course catalogue for each course unit.

While in the Department of Physics the courses are almost exclusively in English, this may be different for general elective courses (see 2.5 / 2.6), including those in the category "GESS Science in Perspective". It is recommended to check the language of instruction of these latter courses carefully, as many are also offered in German.

1.4 Communication and myStudies

Each ETH-student has or will receive an **ETH-email address**. Please make sure to read your emails regularly or forward them to another address you use primarily. The central administration (rectorate, examination office, etc.) and the study administration in Physics will send you important information about exam registration, enrolment etc. As soon as the message can be retrieved from the ETH-email server the message is considered as **"officially delivered"**⁸.

Via the student portal **myStudies** → www.myStudies.ethz.ch you will see and deal with most of the administrative topics concerning your studies at ETH Zurich. You enrol for your programme each semester; sign up for the courses and register for the examinations etc. After the enrolment of your courses you will receive a **time table** containing the lectures and exercises schedule. You also receive the results of the exams in your transcript of records in myStudies (detailed process described in 3.2.4).

Please make sure that your personal details are always up to date. Via the link "Change address" you can define your various addresses and other data. If your marital status, name or another information which you cannot change yourself has to be corrected, please contact the registrar's office (see 7.2).

6 See directive "Direct doctorate programme" (binding version in German).

7 More details in the directive "Language of instruction".

8 Regulated in article 17 of the ETH Zurich Admissions Ordinance.

1.5 Teaching Evaluation

You will regularly be asked to fill in lecture- and exam-surveys. We are grateful for your help and are relying on you to assist us in reviewing and improving the teaching at ETH Zurich. On the website of the → [teaching evaluation](#) you can find further information.

In the Department of Physics the results of the teaching evaluation are presented, analysed and tracked in the D-PHYS Teaching Committee (Unterrichtskommission D-PHYS). The teaching evaluations are done towards the end of the semester or shortly after the exams and summarise the teaching of a course for one semester. There is also the possibility of a formative evaluation during the semester (semester feedback). This evaluation can be initiated by the lecturer, your student organisation (see 7.4) or the department. The semester feedback is often carried out via the ETH EduApp (see 7.8). In taking part in this evaluation you can influence the quality of your lecture.

1.6 Course Catalogue

In the course catalogue (→ www.vvz.ethz.ch) you find the scheduled hour⁹ and venue of all the courses, information about the course content, examinations, language of instruction and often a link to the course website (most courses in Physics are available on the → [moodle platform](#)).

After the semester has started the content of the course catalogue is fixed and binding (important for information regarding the performance assessment).

The course catalogue for the following semester is published around the end of the current semester. If you want to plan the following semester earlier than that you can orient yourself by checking the previous semester. Many courses are offered on a yearly basis. Please contact the lecturer or the department if you want reliable information as to whether the course will be offered again. Core and regular courses (see study programme) are offered on a yearly basis.

1.7 Academic Calendar

You will find all the relevant information concerning the semester dates, exam period, the graduation ceremony etc. in the academic calendar. Please check the ETH website for further details → www.ethz.ch.

9 Click on "time" in the course catalogue to get the exact starting time of the lecture. Lectures start at different times at the H nggerberg Campus and at ETH Zentrum.

2 STUDY PROGRAMME

We offer a Master programme with a broad selection of courses, covering most of the major aspects of modern Physics. The Master curriculum should encourage breadth, but it should also enable you to specialise if you choose to do so.

Planning your study programme lies within your own responsibility. We offer you help if it is required. You are welcome to consult our student counsellor (see 7.3) or ask a professor in your preferred field for advice.

You are free to choose the courses within the legal framework set by the study regulation. The following chapters describe the choices you have.

2.1 Categories

The regular duration of the study programme is three semesters. You have to acquire 90 CPs in total to obtain your MSc degree in Physics. The right column shows the minimal amount of CPs to be acquired per category.

Core courses	
› Theoretical core subjects (at least 10 credits)	30 credits
› Experimental core subjects (at least 10 credits)	
Elective courses	
› Electives in Physics and Mathematics (at least 10 credits)	20 credits
› General electives	
Proseminars and semester projects	8 credits
GESS Science in Perspective	2 credits
Master's thesis	
Scientific Works in Physics ¹⁰	30 credits
Total	90 credits

2.2 Core Courses

Master core courses (see Table 1) are advanced lectures building on the Bachelor core courses. You have to acquire 30 CPs in total within this category; normally three courses with 10 CPs each. From these courses, a min. of 10 CPs has to be acquired from experimental and 10 CPs from theoretical core courses.

Table 1: Core courses offered in the Autumn Semester are displayed in green and in white for the Spring Semester.

Fields	Semester	Theoretical Core Courses	Experimental Core Courses
Particle Physics	Autumn	Quantum Field Theory I	Phenomenology of Particle Physics I
	Spring	Quantum Field Theory II	Phenomenology of Particle Physics II
Condensed Matter Physics	Autumn	Statistical Physics	Advanced Solid State Physics
	Spring	Solid State Theory	
Astro-physics	Autumn	General Relativity	
	Spring	Theoretical Astrophysics and Cosmology	Astro II: Observational Cosmology and Extra-galactic Astro-physics
			Astro III: Galactic Astrophysics
Quantum Electronics	Autumn		Ultrafast Laser Physics
	Spring		Quantum Optics
			Quantum Information Processing I/II*

*these courses can be counted as a single core course if both parts are taken and examined. Each part can also be counted as an elective course (see 2.3) if taken individually.

2.3 Elective Courses

You can choose from a broad range of elective courses. In total you have to acquire 20 CPs in the category elective courses and at least 10 CPs have to come from the subcategory in Physics and Mathematics as listed in the course catalogue.

“Downgrading” a core course and counting it as an elective one is allowed.

¹⁰ Compulsory for students without a BSc in Physics from ETH Zurich

2.4 Electives in Physics and Mathematics

The Department of Physics offers a number of elective courses on a regular (annual) basis (see Table 2). You can find these and many other courses in the course catalogue, displayed in the following categories:

- › Solid State Physics

› Quantum Electronics

› Particle Physics

› Theoretical Physics

› Astrophysics

› Neuroinformatics
- › Biophysics, Physical Chemistry

› Medical Physics

› Environmental Physics

› Mathematics

› Electives at the University of Zurich

When planning your schedule for the next semester, please check whether courses are offered regularly. Note that D-PHYS institute webpages and previous lecturers may give you additional information on courses and their availability in future semesters (see Table 2).



Table 2: Regular Courses offered in the Autumn Semester displayed in green and in white for the Spring Semester.

	Theoretical Physics	Astrophysics	Particle Physics	Condensed Matter and Quantum Electronics
Autumn Semester		Astro-Particle Physics I	Experimental Methods and Instruments of Particle Physics	Optical Properties of Semiconductors
			Neutrino Physics	Semiconductor Materials: Fundamentals and Fabrication
			Low Energy Particle Physics	Semiconductor Nanostructures
			Particle Accelerator Physics and Modeling I	Introduction to Magnetism
Spring Semester	Advanced Field Theory		Phenomenology of Physics Beyond the Standard Model	
	Symmetries in Physics	Statistical Methods and Analysis Techniques in Experimental Physics		
		Astro-Particle Physics II	Materials Analysis by Nuclear Techniques	

2.5 General Electives

With general electives, you may extend your knowledge in areas of Physics, Mathematics or further scientific disciplines. For this purpose, you may choose from the entire ETH course offer. Exempt are courses from the first two years of the BSc programmes and the GESS Science in Perspective courses (see 2.6). In the course catalogue, you will find a suggested list of courses for general electives by choosing the subsection “General Electives”.

2.6 GESS Science in Perspective (SiP)

During your studies you have to acquire 2 CPs through a course of the “Science in Perspective” programme offered by the Department of Humanities, Social and Political Sciences (D-GESS). The aim of these courses is to enable you to reflect on your disciplinary knowledge and its social context.

Please consult the course catalogue for the offer of SiP courses. Please check the language of instruction of the course. Many courses are only offered in German.

If you choose a language course, please check whether the level of the course is in accord with the directives¹¹. European languages can only be counted towards the category SiP if they are beyond a certain level.

If you wish to take a course outside of the standard courses offered in the course catalogue you will have to check **in advance** with the study administration D-GESS (→ www.gess.ethz.ch), whether the course will be accepted. If yes, please bring the original certificate accompanied by the consent of the D-GESS to the study administration for the registration of the course.

2.7 Proseminars and Semester Projects

During the MSc degree programme you will have to participate in a proseminar or do a semester project involving research on a theoretical or experimental topic. These elements enable you to perform a research project as preparation towards the final Master's thesis. For theoretical topics, participation in a Proseminar is the default recommended option, while theoretical semester projects can be offered in exceptional situations. For experimental topics, a semester project in a lab is the most common arrangement, but experimental Proseminars are also offered. The completion and receipt of the CPs of either a proseminar or semester project is a prerequisite to start the MSc thesis (see 2.8).

In a **proseminar** you carry out a guided self-study of original papers and of advanced textbooks in Physics. Within the general topic, determined each semester, participants give a presentation on a particular subject and deliver a written report¹².

Most proseminars are offered by the Institute of Theoretical Physics and are taken in the second semester of the MSc studies. Each December the Institute of Theoretical Physics offers an information event. Please attend this event if you plan to sign up for a theoretical proseminar in the Spring Semester. One experimental proseminar is offered by the Institute of Particle Physics and Astrophysics.

11 Directive: “Science in Perspective” (SiP) programme of the Department of Humanities, Social and Political Sciences (D-GESS)

12 All written reports have to be accompanied by a → [declaration of originality](#)

In a **semester project** focussing on **Theoretical Physics** you will conduct a small theoretical research project on a topic appropriate to your advanced level. If you wish to focus on **Experimental Physics** you can conduct a project in a research laboratory. The minimal duration of lab work is three weeks full time. Additionally, you need time for the preparation, for writing a report¹² and giving a presentation. In total, this should sum up to roughly 210 hours of work.

Semester projects are preferably carried out at one of the institutes of the Department of Physics, but may also be conducted in another department/university, at a research institution (for example, PSI or CERN) or in the industry. In the category Proseminars and Semester Projects of the course catalogue, further courses which are equivalent to a semester project are offered. Semester projects can be carried out at any time. If accompanied by lectures, the working time has to be adapted in consultation with the supervisor.

If a project is done outside of ETH, an entitled supervisor has to act as an official mentor and has to be chosen when registering for the project in myStudies. He/She has to approve the project and will submit the result of the performance assessment (pass/fail). For external projects, we strongly recommend that all parties agree on a written outline of the project before it is started.

Besides the indicated lecturers in the course catalogue, proseminars and semester projects can be supervised by all professors of D-PHYS and associated members¹³. For details please check the list of authorised supervisors on our website (→ www.phys.ethz.ch)

In order **to find a suitable project** for you, please contact the supervisor directly. Many institutes and groups offer semester projects on their websites.

Theoretical and experimental semester projects have to be registered via Projects/papers/theses in myStudies. For Proseminars and other courses in this category a course enrolment is sufficient.

13 see → [Associated Units](#) on our website

2.8 Master's Thesis

The Master's thesis concludes the Master's programme and constitutes a full-time project of six month duration aimed at advancing the skills and capabilities of students to work independently and creatively towards the solution of an individual research problem which has been agreed upon in advance.

To find a thesis project, please contact the prospective supervisor directly. Similarly to the semester project, you may find thesis projects on the websites of the research groups. If a MSc thesis is done outside of ETH an entitled supervisor has to act as a formal mentor and has to be chosen upon registering for the thesis in myStudies. He/She has to approve the thesis and will submit the grade. For external theses, we strongly recommend that all parties agree on a written outline of the project before it is started.

The MSc thesis can be supervised by all professors of D-PHYS and associated members¹³. For details please check the list of authorised supervisors on our website ([→ www.phys.ethz.ch](http://www.phys.ethz.ch)).

2.8.1 Prerequisites

Before you start your Master's thesis you need to have

- › completed a proseminar or a semester project (see 2.7) and earned the corresponding CPs;
- › completed additional admission requirements where applicable¹⁴;
- › completed your BSc studies (at least handed in your degree request).

2.8.2 Registration

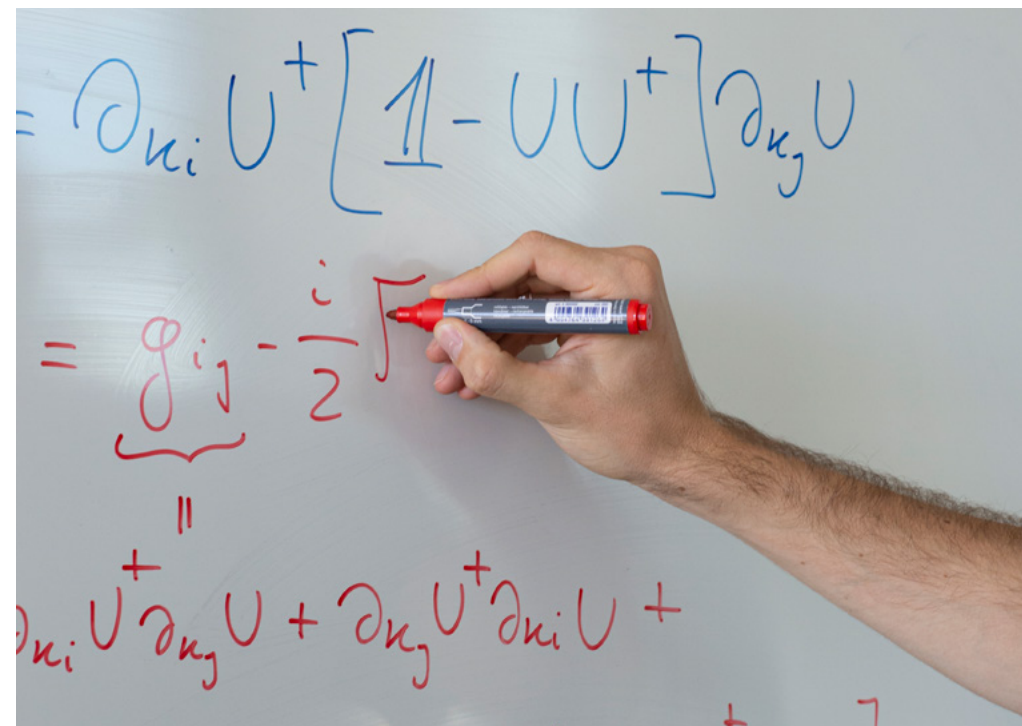
The registration for the Master's thesis has to be done via myStudies. Please choose Projects/papers/theses to start the registration. Fill in the required information and wait for the approval of your supervisor and the study administration. The registration has to be done before the start of the thesis.

2.8.3 Completion

Please hand in your thesis to your supervisor by the deadline appearing in myStudies at the very latest. He/She will confirm the receipt and evaluate your thesis within roughly one to two weeks. If you do not receive your grade in time, please contact your supervisor directly. If he or she doesn't react the study administration can assist you.

If, for a reason beyond your control, you cannot hand in your thesis in time, you will have to submit a request for extension. Please send the well justified request accompanied by a confirmation of your supervisor and (if applicable) a medical certificate to the study administration. The director of studies can extend your deadline for justified reasons.

The Department of Physics and other departments offer many seminars and talks about physics related topics or other subjects. Every Wednesday D-PHYS organises the Physics Colloquium together with the Physics Department of the University of Zurich (see: [→ www.colloquium.phys.ethz.ch](http://www.colloquium.phys.ethz.ch)). The schedule for seminars offered in our department is displayed here: [→ www.phys.ethz.ch](http://www.phys.ethz.ch)



¹⁴ see on your admission letter if you haven't obtained a BSc in Physics from ETH Zurich

3 CREDIT SYSTEM AND PERFORMANCE ASSESSMENTS

3.1 Credit and Grading System

3.1.1 Credit System

Your study is based on a credit system according to the European Credit Transfer System (ECTS)¹⁵. The credit points (CP) describe the average workload necessary for the completion of a course. One CP corresponds to 25 to 30 hours of work. The total workload per semester studying full-time is 30 CPs on average. The regular duration of studies is three semester with a total of 90 CPs.

3.1.2 Grading System

The grading scale ranges from 1.0 (lowest mark) to 6.0 (highest mark); pass mark is 4.0. The increment is 0.25 for graded performance assessments. Ungraded performance assessments are graded with "pass" or "fail". CPs are only awarded for passed performance assessments.

The overall GPA is displayed with two decimals after the comma and calculated as weighted (CP) average of all graded performance assessments¹⁶.

3.2 Performance Assessment

Performance assessments are either organised in individual exams or in block exams. To pass an individual exam, you have to achieve a grade of at least 4.0. In block exams, the (weighted) average of all exams has to be 4.0 or higher. Block exams are normally not offered during the MSc studies.

Every performance assessment can be repeated once. Passed performance assessments cannot be repeated. Once a performance assessment has been failed twice, the course counts as definitely not passed.

At ETH Zurich three different types of exams are offered; session examinations, end of semester examinations and semester performances (details see page 19). The modality of each exam is defined in the courses catalogue. Once the semester has started the modalities (language, mode (oral or written), aids, etc.) are fixed and binding for all parties.

The legal framework for the performance assessments is regulated in the ETH Zurich → [Ordinance of performance assessments](#) (legally binding version in German¹⁷).

3.2.1 Session Examination

Session exams are the most common type of exam for lectures in our programme. Exams for most courses are conducted orally, while major core courses typically rely on written exams. They take place during a four-week period at the end of the lecture-free period; after the Autumn Semester, from January to mid-February (weeks 4 to 7) and after the Spring Semester, in August (weeks 32 to 35). Your personal exam schedule for written exams is published within the last weeks of the semester; the schedule for oral exams is fixed and communicated later, but before the session period begins.

Session exams have to be **registered bindingly** during the registration period at the beginning of the semester in myStudies. Late registrations are only possible for a fee, but depending on the time of the registration, possible clashes with other exams cannot be avoided. **Deregistration** is possible until one week before the session period starts. You will be notified by email shortly before the deadline. If you do not attend a registered exam it will count as a "failed" exam, with the result "no show".

Session examinations are organised centrally by the → [examination office](#). Please register only for exams you will most probably take. The examination office organises the scheduling for all ETH-wide session exams. Therefore, each registration has an impact on the planning for all students.

You can repeat a failed exam in any subsequent exam session. Please note that as soon as the lecture is given again, the content and the modalities of the most recent lecture are relevant for the exam. Please contact the lecturer for the relevant information if you cannot attend the new lecture.

3.2.2 End of Semester Examination

End of semester examinations are held during the last two weeks of the semester or during the first two weeks of the semester break. Date, time and location of the exam are communicated by the lecturer. Similarly to the session examinations, a binding registration in myStudies is necessary. The dates for registration are communicated by the examinations office. Repetitions are normally held a few weeks later at the end of the semester break. Date and location are again organised by the lecturer.

¹⁵ See directive „Kreditsystem (ECTS): Richtlinien zum Kreditsystem“

¹⁶ Any grades from the GESS Science in Perspective courses are excluded from the overall GPA (see Art. 33b in the regulations¹).

¹⁷ 414.135.1 Verordnung der ETH Zürich über Lerneinheiten und Leistungskontrollen an der ETH Zürich

3.2.3 Semester Performances

Semester performances can be graded or not graded. The performance assessment is not tied to any fixed date and can consist of different parts (e.g. a written report, a presentation, group work, exams, etc.). The details of the semester performance are either fixed in the course catalogue or communicated by the lecturer at the beginning of the course.

Often a repetition is only possible after retaking the course. In the MSc programme in Physics all projects and the Master's thesis (specially regulated, see 2.8) are assessed as semester performances.

3.2.4 Communication of the Result and Review of Grading

After the correction and submission of the result by the lecturer, the study administration decrees the result. Subsequently you will receive an email with the message that you can view the result of one or several exams in myStudies.

Please check the transcript of records in myStudies. If the performance is not assigned automatically to the correct category (this also depends on how the exam registration was carried out by you), please correct the category. If this is not possible, please contact the → [study administration](#).

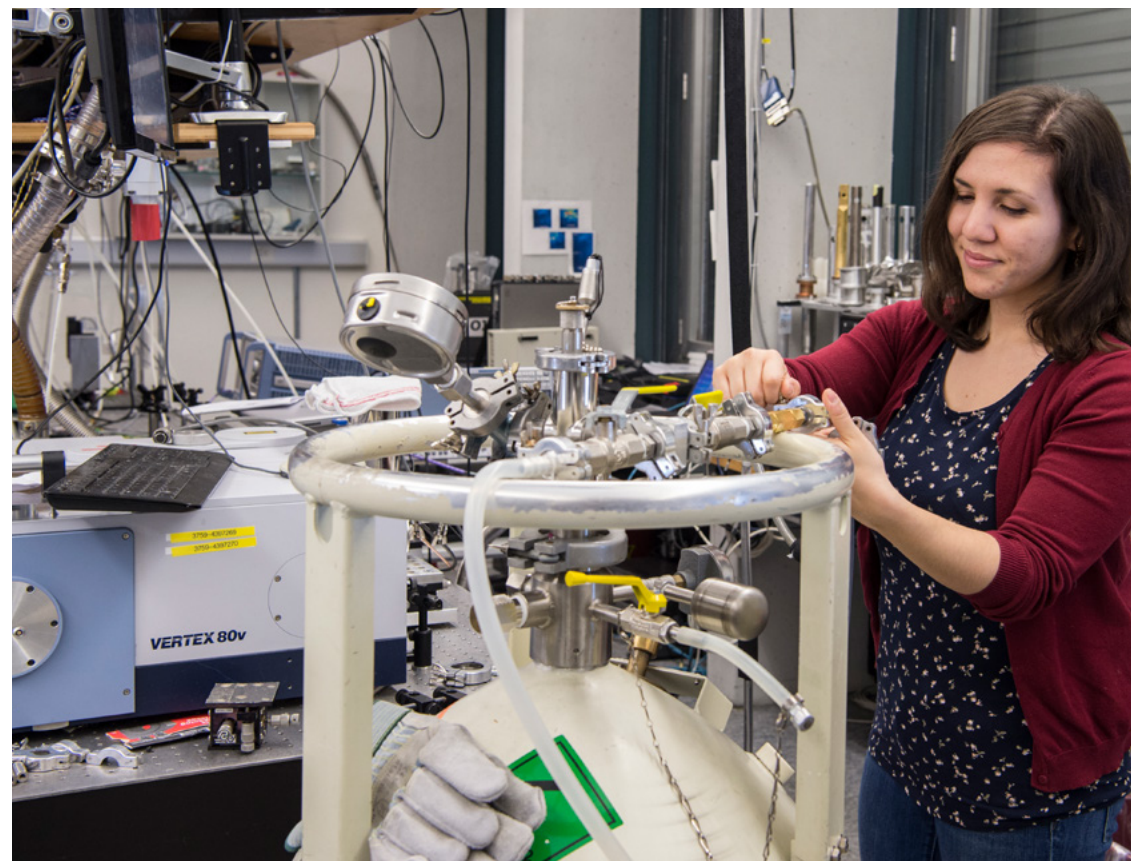
You have the right to review the grading of written exams as regulated by a directive of the rector¹⁸. After the result for a written exam has been published, the lecturer will likely propose a date for the grading review within the following 3 weeks. Please keep to this date if you are interested in reviewing the exam. If no central review session is organised, you may arrange an individual appointment with the lecturer up until half a year after the grade was decreed.

3.2.5 Right of Appeal and Means of Legal Redress Regarding Grades

If you do not agree with the grading or think that the exam was not held in a fair manner, please contact the examiner in charge directly. Before you make an appeal we strongly recommend that you speak to the director of studies and/or the study coordinator of the department. If no agreement is reached you have two different ways to appeal. You can either write a "Reconsideration/Cancellation Application" to the Vice-Rector for Study Programmes (ETH-internal) or hand in an appeal to the ETH Appeals Commission (outside ETH). You may find the details for both processes in the information sheet on the website providing → [legal advice](#) of the rectorate.

For both types of appeals you need an **appealable decree** issued by the study administration. After receiving the email that your grades are available online, you have 30 days to ask for the appealable decree (in paper form). From the date of issue of this document onwards you have another 30 days to hand in your appeal. After this deadline has passed your right of appeal expires. The appealable decree is free of charge and triggers nothing unless you make an appeal.

If the discussion with the lecturer and/or the director of studies takes longer than the deadline for an appeal you may consider handing in a precautionary appeal.



¹⁸ See directive "Viewing and transfer of performance assessment records" (the German version is legally binding).

4 STUDENT EXCHANGE

A semester abroad is possible during the MSc studies¹⁹ if you have acquired an ETH BSc degree in Physics with good/above-average grades. You can acquire up to 30 CPs awarded during a student exchange towards the degree (of which at most 10 CPs can be counted as core courses). Both lectures and semester projects are possible during an exchange programme. Check our website and contact our exchange coordinators if you are planning a → [student exchange](#).

Please note that the CPs for the MSc thesis abroad and courses from the University of Zurich (UZH) listed in the ETH course catalogue are not counted as student exchange credits.



5 REQUEST FOR DEGREE CONFERRAL

5.1 Study Period and Degree Conferral

As soon as you have collected the minimally required CPs in all the relevant categories (see Categories page 10) or at the latest at the end of your **maximal study period of 3 years** you will have to hand in your request for degree conferral. Please note that the conferral **does not happen automatically**.

A maximum of 100 CPs can be counted towards the degree. Additional courses will be listed on the addendum of your degree certificate. Your overall GPA is calculated with the weighted (CP) grades of all graded performance assessments. GESS Science in Perspective courses are not included.

The degrees are issued regularly by the study administration and the academic services. Depending on the date of issue you will be invited to the corresponding graduation ceremony (please check our website for → [dates and more details](#)).

Your degree certificate and your diploma will be sent to you by registered mail²⁰. From the date of issue onwards you can bear the title of

Master of Science ETH in Physics (MSc ETH Physics)	English
Master of Science ETH in Physik (MSc ETH Physik)	German

or the short title of “**MSc ETH**”.

The degree certificate you receive comprises:

- › Degree Certificate (in German, French or Italian)
- › Academic record (inc. grades and CPs) in German
- › English translation of the final academic record
- › Ranking information (bilingual German/English document)
- › Diploma supplement (describing the educational system and containing a list of your courses with a short description of the content).

¹⁹ See Art. 15 in the study regulation (RSETHZ 324.1.0900.21)

²⁰ Please do not forget to update your addresses in myStudies.

WHAT YOU ACQUIRE WITH THE MSC DEGREE IN PHYSICS OF ETH ZURICH:

Introduction

The Master's degree programme in Physics consolidates the fundamental knowledge acquired during the Bachelor 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

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

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.

Design 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.

Self- 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.
-

5.2 Graduation and Awards

You graduate with distinction if you achieve an overall GPA (calculation see section 5.1) of 5.75 or higher. The “Willi-Studer-Preis” is issued for the student with the highest overall GPA within one cohort of graduates.

For excellent MSc theses the ETH Medal can be awarded if nominated by the supervisor of the thesis and the award committee of the Department of Physics.

Both prizes will be awarded at the Master's degree graduation ceremony.

The → [graduation ceremony](#) takes place once a year; approximately at the end of May or in June. You will be invited to the ceremony and may bring along your relatives and/or friends.



6 CONTINUING EDUCATION

6.1 Teacher Training Programme

The Teacher Training programme in Physics (Lehrdiplom in Physik) is offered in German and can officially be started after you have received your MSc degree. Nevertheless, you can enroll in courses towards the “Lehrdiplom” already in parallel with your MSc studies and some courses can be counted towards both degrees. Please check the website of the → [Teacher Training programme](#) for further details.

This education provides you with a solid didactical education and enables you to teach at Swiss high schools (Maturitätsschulen) or Universities of Applied Sciences (Fachhochschulen). The programme lasts approx. one and a half years and comprises courses of a total of 60 CPs. The programme can be done as an extra-occupational training and has to be completed within 6 years after its start.

With an ETH BSc and MSc degree in Physics you can start your studies without any additional admission requirements. However, with different previous degrees or if your graduation in physics was long ago, there may be additional admission requirements.

In addition, we offer a teaching certificate (Didaktik-Zertifikat, DZ). The DZ certifies the successful completion of basic didactic training for the purpose of taking a teaching post at a University of Applied Sciences (Fachhochschule) or at a vocational school (Berufsschule). See details at → www.ethz.ch (in German).

6.2 Doctoral Studies (PhD)

A majority of graduates with a Master's degree in Physics continue their career towards doctoral studies. ETH Zurich offers outstanding conditions for a doctorate: an innovative atmosphere, state-of-the-art equipment and laboratories and an environment that inspires the scientific talent of the future.

Applicants should directly apply for a PhD position with the prospective thesis advisor. We recommend checking the corresponding website for current research projects and then contacting the professor about available projects.

You will need the approval of the thesis supervisor before submitting your formal application to the → [Doctoral Administration Office](#).

7 GENERAL INFORMATION, LINKS AND APPS

7.1 Study Administration

For all questions relating to your studies you can reach the → [study administration](#) via email (studiensekretariat@phys.ethz.ch), by phone or at our counter at the Höggerberg campus at HPF G9.1. You can find the opening hours on our website.

7.2 Registrar's Office

For questions related to your enrolment at ETH, a leave of absence, tuition fees, personal information (which you are not able to change via myStudies), etc. please contact the registrar's office at the main building or check their → [website](#).

7.3 Student Counselling

Our → [student counselling](#) helps you with questions concerning your choice of courses, such as which elective courses you may choose, where to look for a semester project, how to plan your programme after failing an exam, etc.

Besides the availability of student counselling on a departmental level ETH also offers general counselling and coaching for students running into problems with their time and exam management, etc. Please check the website of the → [Student Services, Counselling & Coaching](#) for more information.

If you need help to overcome a difficult phase in your life or are experiencing trouble with your studies – but also in case of an acute crisis – the psychological counselling services of ETH and the University of Zurich are there for you (→ www.pbs.uzh.ch).

If any problem occurs, we strongly advise you to contact us or the counselling services mentioned above as early as possible. The sooner you get help the easier it may be for you to overcome your problems. All these services are free of charge.

7.4 Student Association VMP

Your student association → [VMP](#) (Verein der Mathematik und Physikstudierenden) has been taking care of Mathematics and Physics Students for more than 75 years. They represent you in many faculty meetings, committees, etc. in our department and throughout ETH. They organise several events, such as Fondue evenings or career fairs etc. and provide information about past exams. By choosing to be a member of VSETH, the mother organisation of VMP, you automatically become member of VMP. To be registered as a member of VSETH you would have to pay a small contribution additionally to your student fees each semester.

7.5 Financial

Please check the website of the → [financial aid office](#) for questions regarding financial support, etc. Altogether, the tuition fees are rather low at ETH compared to universities in many other countries. On the other hand, the living costs are relatively high in Switzerland; especially in the city of Zurich.

Please note that an admission to the MSc programme in Physics typically does not automatically involve any financial support.

7.5.1 Scholarships

ETH Zurich supports outstanding students by offering the Excellence Scholarship and Opportunity Award (ESOP). The scholarship is highly competitive and the application has to be made within the international application window in November for entrance in the following Autumn Semester.

7.5.2 Teaching Assistants

There is the possibility of working as a teaching assistant in our department. Please check our website for → [open positions](#). Positions for English speaking students are scarce, good knowledge of the German language is an asset here.

Please note that your workload in such a position must not exceed a maximum of 15 hours per week during the semester. If your nationality is not from an EU or EFTA country you can only be employed as a teaching assistant six months after entering Switzerland (see the date on the residence permit).

7.5.3 Direct Doctorate

In case of exceptional qualification BSc students can directly apply for a PhD position (see 1.2.4). The direct doctorate programme includes a merit-based scholarship during the MSc period and the normal salary during the doctoral studies.

7.6 Locations

ETH Zurich has two main campuses. (→ www.ethz.ch) ETH Zentrum is located in the center of Zurich city, close to the main station. ETH Hönggerberg is located at a distance of a 20 minutes bus ride on the outskirts of Zurich city. The «ETH Link» shuttle bus service connects the two campuses and brings you from either campus to the other. The bus travels three to four²¹ times per hour between the two main campuses. Lectures are offered at both sites, but most lectures offered by our department take place at the Hönggerberg campus. Also, most groups and labs, as well as the administration of the department are housed at the Hönggerberg campus. Some institutes and groups in our department also work at CERN and PSI.

7.7 International Student Support

If you have done your BSc studies in another country our international student support office can help you with various questions regarding immigration, visa, housing, insurance, etc. They offer many different introductory events at the beginning of the Autumn Semester, when most international students start their studies. Please check their → [website](#) for more information as well as the useful → [Handbook for International Students](#).

7.8 Apps

- › ETH Zurich (news, events, buildings, phonebook, catering etc.)
- › ETH Edu App (supports you in your studies, evaluation, etc.)
- › Globe (magazine of ETH Zurich and the ETH Alumni Association)
- › Uniseminar (exam preparation with flash cards)
- › ASVZ (programme of the Sport Association of ETH and the University of Zurich)
- › ETH Polybox (storage tool similar to Dropbox for members of ETH Zurich)

7.9 Student Life

Zurich provides a vibrant and international life. Zurich is repeatedly ranked among the cities with the best quality of life in the world. Many events, a very rich cultural life, proximity to the Alps and other Swiss cities, good public transport and international train and transport connections make Zurich a very attractive city to live in.

As a student, you have many opportunities outside your studies to socialise, do sports, eat and drink, attend parties, etc.



²¹ during the semester

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