

# Study Guide

**Master of Science in Robotics, Systems  
and Control**

2015

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## Introduction

The Master's program in Robotics, Systems and Control is a specialized program offered by the Department of Mechanical and Process Engineering (D-MAVT), the Department of Information Technology and Electrical Engineering (D-ITET) and the Department of Computer Science (D-INFK). It is open to students seeking an outstanding education at the interface between mechanical and electrical engineering and computer science. Bridging the gap between the engineering disciplines, the program offers students a unique learning environment and a multidisciplinary education that will enable them to develop innovative and intelligent products and systems to meet today's most pressing challenges: energy supply, the environment, health care and mobility.

Graduates with knowledge in a range of engineering disciplines are highly sought after by the high-tech industry worldwide. Creating intelligent robots and systems requires skills from a broad range of subjects. It poses fundamental questions about the design, physical modeling and control of complex and highly interactive systems. Furthermore, it deals with various perception principles that enable the students to see and analyze their environment, reason about it and take appropriate actions toward the given goal.

D-MAVT is the leading department of the Master's program and it is responsible for answering academic questions from students interested in and registered for the program. This Master study guide provides information relating to the Master in Robotics, Systems and Control, according to the "Program Regulations of the Master's degree program in Master in Robotics, Systems and Control", (regulation RSETHZ 324.1.0300.40 [in German, an English translation will be soon available, the original German version is the legally binding document]).

Zurich, January 2015

# 1 Master's Program

## 1.1 Tutor System

The Master's program in Robotics, Systems and Control is tutor-driven. The aim of the tutor system is to facilitate a personalized curriculum for the student and provide one-on-one support, which should ensure a top-class specialized education taking into consideration the student's talents and expectations. During the application phase, the Master student must select an authorized faculty member working in the desired area of specialization to be their academic tutor. The tutor will be specified in the admission letter.

Together with the tutor, the student determines the individual curriculum at the beginning of the program which provides the framework for the entire program. The tutor approves the student's choice of courses and advises in the choice of the elective courses, thereby ensuring that their individual requirements and interests can be followed. Furthermore, the tutor coaches the student throughout the program, monitoring progress and if required, proposes necessary adjustments to enhance the student's performance. The tutor's responsibilities in co-operation with the student are also to support the student in his/her search for an industrial internship and to approve it.

In September 2014, 13 professors are acting as tutors (4 at D-MAVT, 3 at D-ITET, 4 at D-INFK, 2 at D-HEST) with various specializations. The authorized professors are listed in the Annex 7.1 with links to the homepages of their corresponding institutes. Each tutor has suggested a sample curriculum, published on the web, as a basis for the Tutor Agreement. Students may adjust it to fit their personal needs and interests.

→ [www.master-robotics.ethz.ch/people/index](http://www.master-robotics.ethz.ch/people/index)

→ [www.master-robotics.ethz.ch/courses/sample\\_curricula](http://www.master-robotics.ethz.ch/courses/sample_curricula)

The agreement between the Master tutor and student – Master Curriculum (in the following text denominated as the Tutor Agreement, Annex 7.2) must be submitted to the D-MAVT Student Administration within 3 weeks of the start of the semester. The Tutor Agreement can be updated or changed during the study period. The updated version should be approved by the tutor and submitted to the Student Administration.

At the student's request the Director of Studies of the Department of Mechanical and Process Engineering may approve a change of tutor if cogent grounds are given. The changes are only possible at the beginning of a semester. A change does not result in an extension of the maximum allowable study duration. Disagreement between the Director of Studies and the student are settled by the Rector of ETH Zurich.

## 1.2 Curriculum Structure

During the Master's program, students must obtain at least 90 ECTS for a Master's degree, 60 ECTS of which must be from ETH Zurich. The curriculum is structured in six categories. In every category a given number of credit points must be attained.

Category	ECTS	Description
Core Courses	36	<ul style="list-style-type: none"> <li>Foundation of the Master's program</li> <li>Knowledge in the area of specialization</li> </ul>
Multidisciplinary Courses	6	<ul style="list-style-type: none"> <li>Deepening scientific knowledge or extending acquired skills</li> <li>Student's choice of courses at D-MAVT, D-ITET and D-INFK</li> </ul>
Compulsory Electives in Humanities, Social and Political Sciences	2	<ul style="list-style-type: none"> <li>General education courses in humanities, social and political sciences from the course catalogue of D-GESS ETH Zurich</li> </ul>
Semester Project	8	<ul style="list-style-type: none"> <li>First experience in the solution of specific robotics, systems and control problems, with use of acquired technical knowledge</li> </ul>
Internship	8	<ul style="list-style-type: none"> <li>12-week internship in a Swiss or foreign company</li> </ul>
Master's Thesis	30	<ul style="list-style-type: none"> <li>Independent scientific work</li> </ul>

## Curriculum Structure

### 1.2.1 Core Courses

A minimum of 36 ECTS must be completed in this category with courses. This is usually equivalent to nine Master semester courses.

The Core Courses form the foundation for the Master's degree program by providing the students with knowledge in the area of specialization.

In consultation with the student the tutor draws up the individual curriculum and in it sets out which courses are compulsory and which are partially or freely eligible.

→ [www.master-robotics.ethz.ch/curriculum/courses](http://www.master-robotics.ethz.ch/curriculum/courses)

### 1.2.2 Multidisciplinary Courses

These courses (6 ECTS) give the students an opportunity to deepen their degree-specific knowledge. The multidisciplinary courses should be selected from the course catalogues of the Department of Mechanical and Process Engineering, the Department of Computer Science and the Department of Information Technology and Electrical Engineering. The Tutor must agree to this choice.

### 1.2.3 Compulsory Electives in Humanities, Social and Political Sciences GESS

Courses in Humanities, Social and Political Sciences GESS (2 ECTS) integrate scientific and technical knowledge with the corresponding social, economic, legal, political, and cultural environment.

These courses are selected from the special course catalogue "Compulsory electives GESS" (Pflichtwahlfach GESS) of the Department of Humanities, Social and Political Sciences (D-GESS) at ETH Zurich.

→ [www.gess.ethz.ch/en/studies/gess-compulsory-elective.html](http://www.gess.ethz.ch/en/studies/gess-compulsory-elective.html)

→ [www.ethz.ch/content/dam/ethz/common/docs/weisungssammlung/files-en/compulsory-electives-gess.pdf](http://www.ethz.ch/content/dam/ethz/common/docs/weisungssammlung/files-en/compulsory-electives-gess.pdf)

#### 1.2.4 Semester Project

The Semester project makes use of the technical knowledge acquired during the Master's program and is aimed at training the students in solving specific robotics, systems and control problems. It should take six weeks full-time work to complete.

The subject of the project has to be approved by the tutor. He defines the task and the roadmap to completing it as well as the criteria for assessment of the project. If the tutor approves it, the Semester project can be taken under the supervision of another ETH professor, with the same requirements.

The project is concluded with a written report and a presentation. 8 ECTS will be awarded for successful completion. If the student does not pass the Semester project a new topic must be defined and undertaken.

Available Semester projects are published on the web:

→ [www.master-robotics.ethz.ch/projects/index](http://www.master-robotics.ethz.ch/projects/index)

It is necessary to register the Semester project in myStudies in order to receive the credit points.

#### Prevention of Plagiarism

To ensure the intellectual property a signed Declaration of Originality is a compulsory component of every Bachelor's/Master's thesis, semester paper or other qualifying paper written during the course of studies.

Further information and required documents are provided on the ETH webpage:

[www.ethz.ch/en/studies/legal-principles-degrees/performance-assessments/plagiarism.html](http://www.ethz.ch/en/studies/legal-principles-degrees/performance-assessments/plagiarism.html)



### 1.2.5 Industrial Internship

The main goal of the 12-week internship is to familiarize students with the industrial work environment. The internship can be undertaken in a Swiss or a foreign company or in a research lab outside the ETH domain. The internship must be at least 12 weeks long and must be approved by the tutor.

Tutors can often support their students in finding a suitable internship position. Further useful information can be found on the ETH students' portal and IAESTE Switzerland or on the web page of D-MAVT.

- [www.gess.ethz.ch/en/studies/gess-compulsory-elective.html](http://www.gess.ethz.ch/en/studies/gess-compulsory-elective.html)
- [www.eth-gethired.ch](http://www.eth-gethired.ch)
- [www.iaeste.ch](http://www.iaeste.ch)
- [www.master-robotics.ethz.ch/curriculum/internship](http://www.master-robotics.ethz.ch/curriculum/internship)

To acquire the 8 ECTS for the internship, the student must complete the following steps:

- Obtain an internship (with or without the help of the tutor).
- Work in a company or a research institute for at least twelve weeks.
- Receive a letter of confirmation from the company.
- Write an activity report (1-3 pages) - by keeping trade secrets - with information about the company, a description of the activities and its position in the market, tasks performed and skills achieved.
- Obtain the signature of the ETH Tutor on the confirmation letter.
- Submit (by regular mail) the documents to the D-MAVT Internship Services for their approval:

Internship Services

LEE K 208, Leonhardstrasse 21, 8092 Zürich

E-Mail: [praktikantendienst@mavt.ethz.ch](mailto:praktikantendienst@mavt.ethz.ch)

It is necessary to register the Internship in myStudies in order to receive the credit points.

If the student has already done an internship before starting the Master's program and he/she did not use the credits for previous degree, may apply for recognition, by handing over the necessary documents (see above) to the D-MAVT Internship Services.

### 1.2.6 Master's Thesis

The Master's thesis concludes the degree program and is aimed at enhancing the student's capability to work independently toward the solution of a theoretical or applied problem in a scientifically structured and independent manner. The choice of the subject and the supervisor of the Master's thesis have to be approved by the tutor.

In order to start the Master's thesis, students must:

- have obtained a Bachelor's degree;
- have fulfilled all specified admission conditions;
- have acquired the credit points relating to the Semester project (8 ECTS)

The Master's thesis constitutes a maximum six-month, full-time project. The supervisor defines the tasks and date for completion of the Master's thesis as well as the criteria for assessment. Students earn 30 ECTS for the successful completion of their thesis. The thesis is concluded with a written report and a presentation.

If a Master's thesis is not successfully completed, a new topic must be defined. A new supervisor for the Master's thesis can be appointed. Only one repetition is permitted.

It is necessary to register the Master's thesis in myStudies in order to receive the credit points.

To carry out the Master's thesis in the industry, the approval of the tutor is required.

Any form of remuneration may not be agreed upon by students or institutions of ETH Zurich with third parties. Expenses, however, may be paid by third parties.

→ [www.ethz.ch/en/studies/legal-principles-degrees/legal-basis/directives.html](http://www.ethz.ch/en/studies/legal-principles-degrees/legal-basis/directives.html)

If secrecy between ETH Zurich and the industrial partner is required, it has to be specified in an arrangement between the responsible professor and the company.

The ownership of the property laws has to be regulated for each particular case.

→ [www1.ethz.ch/rechtsabteilung/docs/immat](http://www1.ethz.ch/rechtsabteilung/docs/immat) (in German)

### Prevention of Plagiarism

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Further information and required documents are provided on the ETH webpage:

[www.ethz.ch/en/studies/legal-principles-degrees/performance-assessments/plagiarism.html](http://www.ethz.ch/en/studies/legal-principles-degrees/performance-assessments/plagiarism.html)

## 1.3 Master's Degree

For the request of the degree, following prerequisites must be fulfilled:

- All credit points from the six categories have been obtained.
- The list of courses corresponds with the Tutor Agreement signed by the tutor.
- The application takes place within three years of beginning the Master's program.

When these points have all been completed, the Master's degree will be conferred and the student may assume the title of:

## **Master of Science ETH in Robotics, Systems and Control**

(MSc ETH RSC)

The shorter form MSc ETH may also be used.

Students may have maximal 100 ECTS recognized for the Master's degree. Additionally obtained credit points may be listed, at the student's request, on the addendum of the final academic record (Addendum Master's degree – Academic Record Translation).

The Overall Grade Point Average of the Master's degree is a weighted average of all grades associated with the ECTS.

- Core Courses : 36 ECTS
- Semester project: 8 ECTS
- Master's thesis: 30 ECTS

The grade point average of the Core Courses is weighted according to the credit points of each course (consists of the weighted means of all grades issued in this category; the grade's weighting equates to the corresponding number of credit points).

The Internship, the Multidisciplinary Courses and the courses in Compulsory Electives in Humanities do not influence the Master's degree grade.

Students receive German and English transcripts, ranking information and a diploma supplement, in addition to an official diploma either in German, French or Italian.

Outstanding students with an overall average grade of 5.75 (or higher) will be awarded with the title "passed with distinction". This title will be specified on the diploma and the transcript.

## 1.4 Duration

The Master's program is designed as a full-time study program. The completion of 90 ECTS requires on average 3 semesters, or one and a half years of study. The Master's degree must be obtained within three years, otherwise credits will expire and students may be disqualified from graduation.

If an applicant for the Master's program is accepted with additional requirements, the maximum permitted duration of studies may be extended by half a year for required extra credits in the range of 21 – 30 and by one year for required extra credits in the range of 31 – 60. For fewer than 21 required extra credits no extension is granted.

The Rector may approve an extension of the study duration under special circumstances.

## 1.5 Language

Course units in the Master RSC and the corresponding performance assessments are normally conducted in English. The language used is listed in the Course Catalogue.

→ [www.course-catalogue.ethz.ch](http://www.course-catalogue.ethz.ch)

## 2 Administrative Application – myStudies

The web application “myStudies” enables ETH Zurich students to execute their administrative tasks online. The myStudies application is available to all active ETH Zurich students, using the “nethz” (username) and password. The username and password will be assigned by the Rectorate once complete enrollment documents are received by ETH Zurich.

[www.mystudies.ethz.ch](http://www.mystudies.ethz.ch)

Essential functions in this application are:

### At the semester start:

- Enroll for the coming semester or take a semester on leave of absence.
- Register for course units (lectures, colloquia, exercises, Semester projects/papers).
- The personal weekly schedule can be checked in accordance with the enrollments.

### During the semester:

- Registration for examinations, withdrawal from examinations.
- Publication of the personal examination timetable.
- Access to electronic learning materials.

### At the end of the semester:

- Check if all requirements for the examination admission are fulfilled and print the study overview.

### After the performance assessment session:

- The results of performance assessments decreed can be checked in the transcript of records and relocated if necessary.
- Submit the request to issue the degree.

### 3 Performance Assessment

A performance assessment is required for all courses of the program. The type of assessment is defined by the lecturer. For example, assessments can be made through exercises, projects, presentations or tests. Details may be found in the Course Catalogue of ETH Zurich.

→ [www.course-catalogue.ethz.ch](http://www.course-catalogue.ethz.ch)

Credit points are only issued if the assessment is graded with at least a 4.0 (out of a 6.0) or a “pass”. The Core Courses, the Semester project and the Master's thesis must be assessed with a grade. In the case of unsatisfactory performance, the performance assessment may be repeated once, whereas the Semester project and the Master's thesis need to be on a new subject.

#### 3.1 Grading System

Courses can be assessed with “pass/fail” or with a grade. A course is passed if the grade is 4.0 or higher. In Switzerland the following general grading scale is used:

6.0 – 5.75	excellent
5.5 – 5.25	very good
5.0 – 4.75	good
4.5 – 4.25	satisfactory
4.0	pass
3.5	fail
3.0	poor
2.5	very poor
2.0	extremely poor
1.0	not measurable

Grading scale

The grading scale at ETH Zurich ranges in courses with quarter grade steps (0.25).  
ETH Zurich does not use the ECTS Grading Scheme.

## 3.2 Credit Points

The credit system of ETH Zurich is based on the European Credit Transfer System (ECTS). Credits are assigned to each learning unit according to the expected student workload.

The ECTS is based on the workload of a student. 60 ECTS-credits are equivalent to one year of full-time study (about 1800 hours). Therefore, 1 ECTS corresponds to a 30 hour workload.

Courses at D-MAVT are indicated with credit points as well as weekly hours. In general 4 ECTS are equal to 3 hours contact time (lecture + exercises).

Credit points are awarded for successfully completed assessments. Partial awarding of credit points is not allowed. Students must file for the Master's degree within the stipulated time frame or credits will expire.

A summary of the student's credit points can be found at:

[www.mystudies.ethz.ch](http://www.mystudies.ethz.ch)

→ Functions → Transcript of records

Credits acquired via courses which are offered in ETH Bachelor's and Master's degree programs may be recognized towards the Master's degree if these credits have not already been counted towards the Bachelor's degree.

It is not possible to recognize ECTS credits obtained from previous studies outside ETH Zurich.



### 3.3 Examinations

Information on the examination mode for every course can be found in the Course Catalogue in the category "Performance assessment information":

→ [www.course-catalogue.ethz.ch](http://www.course-catalogue.ethz.ch)

<b>ECTS credits</b>	<i>Number of ECTS credits received after successfully completing examination</i>
<b>Examiners</b>	<i>Name of the lecturer</i>
<b>Type</b>	<i>Session examination or end-of-semester examination, graded or ungraded semester performance</i>
<b>Language of examination</b>	<i>German / English</i>
<b>Course attendance confirmation required</b>	<i>Not required</i>
<b>Repetition</b>	<i>Repetition only possible after re-enrolling for the course unit / repetition possible without re-enrolling for the course unit</i>
<b>Additional information on mode of examination</b>	<i>Any additional information about the exam</i>
<b>Mode of examination</b>	<i>Oral / Written, duration</i>
<b>Written aids</b>	<i>Pocket calculator, compendium, etc. ...</i>

Information about examinations in the Course Catalogue

If a change in specification affects the ongoing semester, students will be informed.

Master examinations are always single and conducted individually.

At ETH Zurich different types of examination are possible:

Session examinations: This form of performance assessment is carried out during the examination sessions, which are held twice a year (once in the winter session (January/February) and once in the summer session (August)). Students must register for session examinations during the registration period. These examinations are

planned by the Examinations Office and are listed in the student's personal examination schedule, which is shown in myStudies. Not all session examinations are offered each session. There are performance assessments which are only offered in the session immediately after the course. These examinations are identified in the Course Catalogue by the following label: "Repetition only possible after re-enrolling for the course unit".

End-of-semester examinations: This form of performance assessment is carried out during the last two weeks of a semester and during the first two weeks after the end of the semester. Registration during the prescribed period is also necessary for performance assessments. The examination dates are announced by the lecturer offering the course. These examinations are thus not shown in the examination schedule in the online enrollment. If it is possible to repeat a performance assessment without re-enrolling in a course, a repetition date, generally at the start of the following semester, is offered. The lecturers offering the course also announce these dates. Students must register for a repetition date using the online enrollment; this is only possible once the Administration Office has officially published the results.

Semester performance: This usually takes the form of integrated performance assessments during the semester or performance assessments which take place outside of the normal semester schedule (e.g. block courses). Semester performances may be graded or ungraded. No separate registration is required for this form of performance assessment. However, students must enroll in the respective course.

#### Registration for / withdrawal from examinations

The student must register for the examination during the third or fourth week of each semester:

- [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch)
- [www.ethz.ch/students/en/studies/performance-assessments.html](http://www.ethz.ch/students/en/studies/performance-assessments.html)
- [www.ethz.ch/students/en/news/academic-calendar.html](http://www.ethz.ch/students/en/news/academic-calendar.html)

The provisional specifications are on the personal examination plan, which is published on

→ [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch)

→ Functions → Examinations

about four weeks (Spring semester), respectively six weeks (Autumn semester) before the end of the semester.

It is possible to withdraw from examinations via myStudies (otherwise the examination will be considered as a first attempt), according to the following deadlines:

- Session examinations: from the third week of the semester until Sunday at midnight (24:00 hours) one week before the start of the examination session.
- End-of-semester examinations: from the third week of the semester to the penultimate week of the semester (Monday morning, 8:00 hours).

## 4 Mobility

A period of stay as a mobility student at another university enriches the student's experience and extends their horizons. Apart from a view of the research and theory at other universities, a guest semester offers the possibility to learn about other cultures and ways of life and of deepening language knowledge. Therefore, ETH Zurich and D-MAVT promote and support student mobility. The exchange programs are normally not open for students in the Master's program without an ETH Bachelor; for these students, if the tutor or the supervisor agrees, it is possible to carry out the Master's thesis abroad.

Applications to mobility programs will be considered only for students with a good study profile, i.e. continuity in completing coursework, good grades and when supported by the tutor. Moreover, the student has to prove his knowledge of the local foreign language.

The tutor approves the suggested program of the courses to be carried out at a partner university in the "Core Course" category and the research projects in the category "Semester project" or "Master's thesis". The agreement has to be submitted to the D-MAVT Student Administration.

According to ETH Zurich regulations, at least two-thirds of the credit points required for a Master's degree must be obtained at ETH Zurich. This condition implies that a maximum of 30 credit points may be obtained at another university and counted towards a D-MAVT Master's degree. Furthermore, at least 12 credits in the category core courses (36 ECTS) have to be achieved at ETH Zürich.

In addition to institutional partnerships and exchange programs with European, American, Australian and Asian universities, professors at D-MAVT have contacts with

other universities and there is often the possibility to write a Master's thesis as part of a research project conducted outside of ETH Zurich.

Mobility credit points must be recognized by the Student Administration of D-MAVT and must therefore be discussed prior to departure with a mobility advisor. An agreement exists between some universities and the ETH Zurich for the recognition of courses and credit points. Up to one year is needed to plan and organize an exchange semester.

The Student Exchange Office at the Rectorate advises and supports study exchanges with partner universities at home and abroad:

→ [www.ethz.ch/en/the-eth-zurich/organisation/infrastructure-divisions/rectorate/student-exchange-office.html](http://www.ethz.ch/en/the-eth-zurich/organisation/infrastructure-divisions/rectorate/student-exchange-office.html)

D-MAVT Mobility Advisor:

→ [www.mavt.ethz.ch/studies/exchange-and-visiting-studies.html](http://www.mavt.ethz.ch/studies/exchange-and-visiting-studies.html)

## 4.1 Planning an Exchange Semester

In planning an exchange semester, the student must organize and prepare the necessary documentation. The documentation required and the time schedule depends on the specific program and the student must follow the instructions given by D-MAVT Student Administration and the ETH Student Exchange Office for each program.

The following steps must be taken:

- 1) Students should obtain information about the host university on the web page of D-MAVT (possible host universities and experiences of former students can be found on the pages of the Exchange Office).

- 2) The student must discuss the possibility of an exchange with their tutor. They should clarify with the tutor whether they are interested in taking courses or completing their Master's thesis during this semester.
- 3) The student must discuss their plans with their mobility advisor. The advisor will decide on their participation with the host university. If several students are interested in an exchange semester at the same university, a selection will be made.

Subsequently the student must prepare a study program and check it with their tutor and mobility advisor. Ideally, it should be structured in a way to replace the courses the student would forego at ETH.

## 5 Program Requirements, Application and Enrollment

### 5.1 Program Requirements and Admission

Candidates for the Master's program should hold an ETH equivalent university Bachelor's degree or a Bachelor's degree from a Swiss University of Applied Sciences in one of the following disciplines (= qualifying disciplines):

- Mechanical Engineering
- Electrical Engineering and Information Technology
- Computer Science

The departmental Admissions Committee reviews the candidates' technical eligibility by comparing the contents of their hitherto obtained education with the requirement profile, which specifies the mandatory essential basis for the Master's program and is based on knowledge and skills taught in Bachelor's programs at ETH Zurich.

The requirement profile comprises a total of 110 credits grouped as follows into two parts:

Part 1: comprises 50 credits and includes basic knowledge of mathematics, physics, computer science and engineering.

Part 2: comprises 60 credits and includes subject-specific knowledge and abilities in the fields of computer science and engineering with the main focus on one or more of the following areas: electronic components and analogue-integrated circuits, distributed systems, integrated systems, mechanics, mechatronics, product development, control engineering, micro robotics and intelligent systems, microsystems technology and nanotechnology, signal processing, communication systems, sensor technology, machine learning, machine-oriented programming, computer architecture, modeling and simulation, randomized algorithms and optimization.

Admission of all applicants is based on the program requirements. The following points will be considered in the evaluation process:

- Assessment of the profile
- Performance and grades
- Personal letter of application describing personal goals and motivation for studying for the Master in Robotics, Systems and Control at ETH Zurich.
- Three preferred tutors and their order of preference
- 2 letters of recommendation
- GRE Test
- Any additional documents that may be relevant for the application, such as scientific or professional publications, awards, information about previous education, etc.
- An English test (Level C1) for non-native speakers (TOEFL, IELTS or equivalent)

Admission is made based on an individual evaluation of the application file (evaluation sur dossier) to establish whether students have sufficient prerequisite courses in their Bachelor's degree. During the admission review, the application will be checked to verify that all requirements are fulfilled. If the student is admitted with a requirement for additional courses, these will be defined and added to the standard Master's program to ensure that the student fulfills the qualification profile. Of the additional requirements, a maximum of 30 ECTS may be completed during the Master's program.

Students holding a degree from a Swiss University of Applied Sciences are admitted with the precondition that they must take a minimum of 40 ECTS and up to a maximum 60 ECTS of additional courses. The additional requirements depend on the specialization at the Swiss University of Applied Sciences.

Students can be admitted with or without additional requirements, but they may be rejected as well. The Rectorate will inform the students in writing of their decision.



## 5.2 Available Study Places

The number of students studying for the Master's degree Robotics, Systems and Control is limited and is dependent on the capacity of tutors to supervise the students.

D-MAVT, in consultation with the RSC Admission Committee and with D-ITET and D-INFK, set the number of students who can be admitted for each semester or academic year.

## 5.3 Application

The Rectorate receives all applications. The application form and detailed information about the application can be found on the web:

Information/guidance:

→ [www.ethz.ch/en/studies/registration-application/master.html](http://www.ethz.ch/en/studies/registration-application/master.html)

The start of the Master's program is generally at the beginning of the autumn semester.

A non-refundable handling fee is payable with the application. There is no fee for candidates from ETH Zurich, EPF Lausanne and holders of an IDEA League Scholarship.

## 5.4 Registration and Enrollment

Upon admission, students receive an invitation to enroll from the Rectorate, together with the information requested for the admission. Upon successful enrollment, students are matriculated and receive their access data for all web tools.

All students must enroll for the chosen Master's program via the electronic enrollment system (myStudies). This tool is also used to enroll for the courses; this should be done after the tutor approves the chosen courses (Agreement between Master Tutor and Student).

Students from ETH Zurich who have not finished a Bachelor's program must enroll for both the Bachelor's program and the Master's program. Semester fees are only billed once.

→ [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch)

## 5.5 Visa and Residence Permit

Students must submit visa applications in person at the Swiss diplomatic mission (embassy or consulate general) in their country of residence at least three months before entering Switzerland. The following link clarifies whether the student needs a visa or not:

→ <https://www.bfm.admin.ch/bfm/en/home.html>

→ [www.ethz.ch/en/studies/international-immigration-housing.html](http://www.ethz.ch/en/studies/international-immigration-housing.html)

The application must be supported by all of the documents listed in "Guidelines for entering Switzerland for foreign students"

For questions concerning residence authorization, students can contact:

International Student Support

HG F 22.3

Phone: +41 44 632 20 95

Fax: +41 44 632 11 17

E-Mail: [international@rektorat.ethz.ch](mailto:international@rektorat.ethz.ch)

## 5.6 Scholarships

A limited number of scholarships is available for applicants with outstanding academic records:

## Excellence Scholarship

- [www.ethz.ch/en/studies/financial.html](http://www.ethz.ch/en/studies/financial.html)
- [www.ethz.ch/en/studies/financial/scholarships/excellencescholarship.html](http://www.ethz.ch/en/studies/financial/scholarships/excellencescholarship.html)

## Markus Meier Funds (students with FH or CH Bachelor's degree)

- [www.mavt.ethz.ch/studies/markus-meier-fund.html](http://www.mavt.ethz.ch/studies/markus-meier-fund.html)

## 6 Useful Information about ETH Zurich

### 6.1 ETH in Short

Consistently rated among the top universities in Europe, ETH Zurich is a leading participant in the world of research and education in Switzerland and abroad. Its 16 departments offer Bachelor, Master and Doctoral programs in engineering and natural sciences.

ETH Zurich has more than 17,000 students from approximately 80 countries, 3,700 of whom are doctoral candidates. More than 400 professors teach and conduct research in the areas of engineering, architecture, mathematics, natural sciences, system-oriented sciences, and management and social sciences.

21 Nobel Laureates have studied, taught or conducted research at ETH Zurich, underlining the excellent reputation of the institute; the most famous graduate of ETH was none other than Albert Einstein.

The international environment – close to 60% of the professors come from outside of Switzerland – and the excellent teaching and research infrastructure make ETH Zurich the ideal place for creative individuals. Connections with business and industry are strong, as the Greater Zurich Area is the economic centre of Switzerland and home to numerous international companies.

ETH has two principal locations: one in the centre of Zurich and the Science City campus at Hönggerberg, just outside the city. Students participating in the Master's program in Robotics, Systems and Control spend most of their time at the central campus.

→ [www.ethz.ch/en/campus/locations.html](http://www.ethz.ch/en/campus/locations.html)

## 6.2 Zurich – the City

Zurich is well-known as a safe and attractive city – indeed, for several consecutive years it has been ranked as having the highest quality of life in the world. Despite its relatively small size (380,000 inhabitants), the city has an international metropolitan flair and offers an extensive range of leisure amenities.

While Berne is Switzerland's political capital, Zurich is considered its business capital: formerly an industrial town, the city's focus has shifted to commerce and knowledge-intensive enterprise.

With its theatres, concert halls, museums, art galleries, libraries, bookshops, and educational institutions at all levels, Zurich is also a centre of cultural importance.

Its location on Lake Zurich and its proximity to the Alps and other places of scenic interest make Zurich a pleasant place to live in both summer and winter.

Zurich has excellent air, rail and road connections. Eurocity and Intercity trains from all directions stop at the central station. Within the metropolitan area, there is a combined network of public transportation, linking rapid suburban rail, trams, buses and boats.

## 6.3 Tuition and Cost of Living

Students should budget between CHF 22,000 and 24,000 (Euro 18,000 to 20,000) per year for tuition and cost of living. This covers tuition and student fees (CHF 664 per semester, as higher education is publicly funded in Switzerland), accommodation, subsistence, health insurance and other personal costs.

→ [www.ethz.ch/en/studies/international-immigration-housing.html](http://www.ethz.ch/en/studies/international-immigration-housing.html)

→ [www.ethz.ch/en/studies/financial.html](http://www.ethz.ch/en/studies/financial.html)

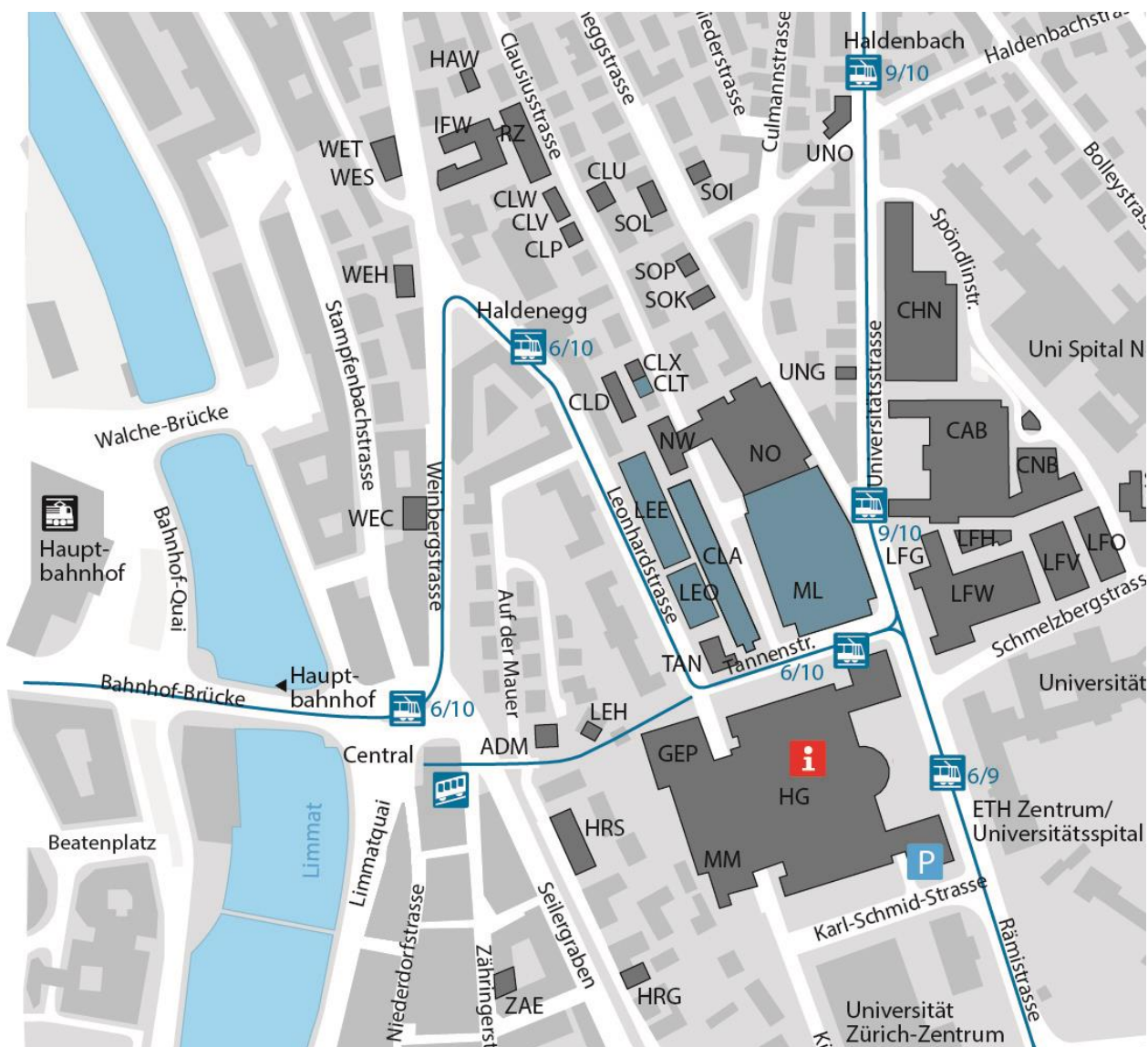
## 6.4 Maps and Directories

Zurich City Guide: [www.stadtplan.stadt-zuerich.ch/zueriplan/stadtplan.aspx](http://www.stadtplan.stadt-zuerich.ch/zueriplan/stadtplan.aspx)

### ETH Building Maps

Location of D-MAVT and ETH Main Building

→ [www.mavt.ethz.ch/the-department/locations.html](http://www.mavt.ethz.ch/the-department/locations.html)

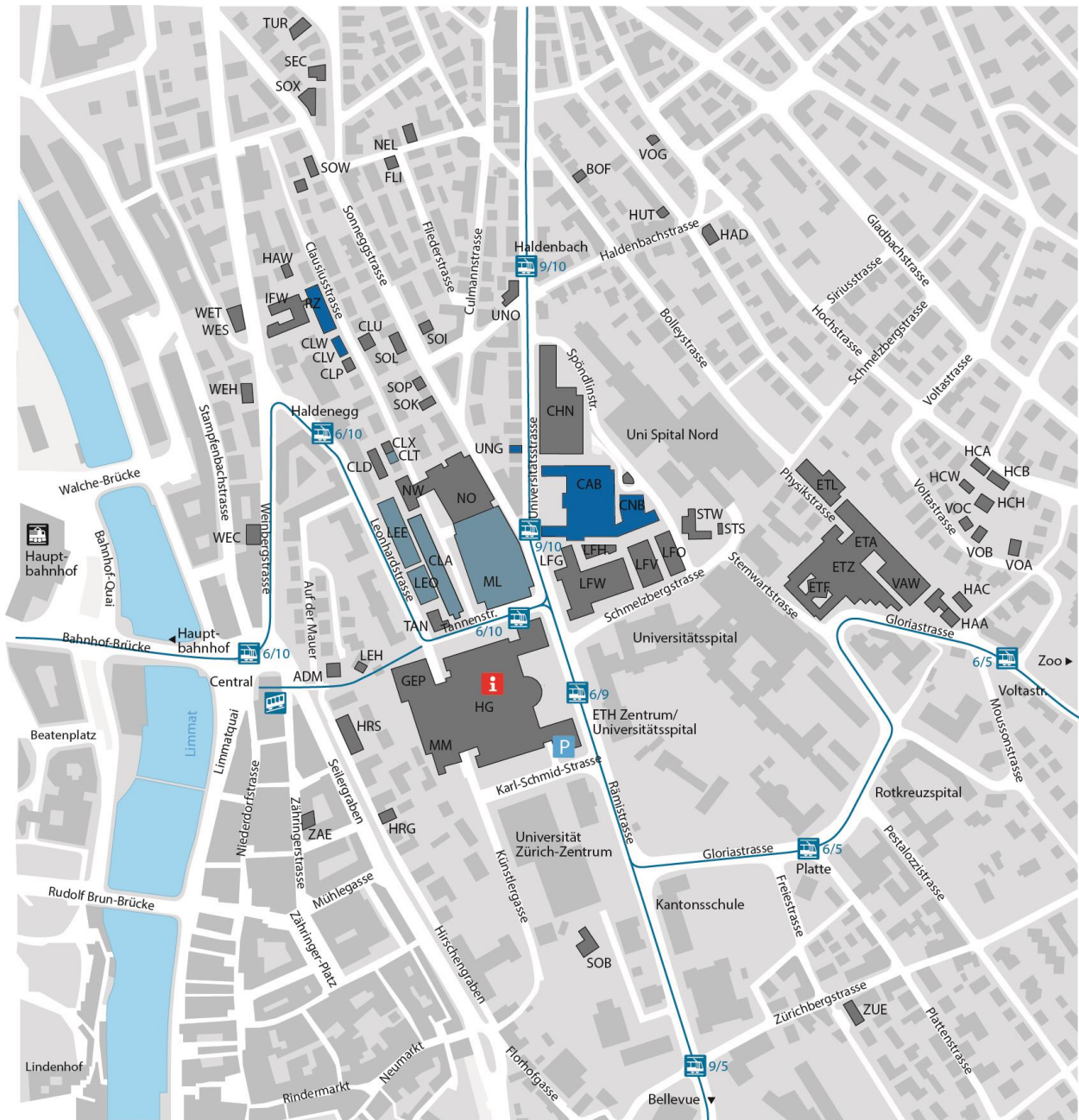






## Location of D-INFK

→ [www.inf.ethz.ch](http://www.inf.ethz.ch)





## 6.5 D-MAVT Contacts

General information about the Department of Mechanical and Process Engineering:

→ [www.mavt.ethz.ch](http://www.mavt.ethz.ch)

Student Administration of the Department of Mechanical and Process Engineering  
ETH Zentrum, LEE K 208  
Leonhardstrasse 21  
CH-8092 Zurich

### Opening hours Student Administration & Internship Services

During the semester	Tue: 09:00 – 13:00, Thu: 13:00 – 16:00 Wed & Fri: 09:00 – 12:00
During the semester break or by appointment	Tue & Fri: 09:00 – 12:00, Thu: 13:00 – 16:00

### **Student Administration (general questions, administration, examinations):**

Phone: +41 44 632 24 57 or +41 44 632 24 52

ETH Zentrum, LEE K 208

E-Mail: [info@mavt.ethz.ch](mailto:info@mavt.ethz.ch)

### **Coordination for mobility, admission, special questions, interim arrangements:**

Phone: +41 44 632 21 99 ETH Zentrum, LEE K 210

Consultation by appointment

### **Internship Services**

Phone: +41 44 633 32 83

ETH Zentrum, LEE K 208

E-Mail: [praktikantendienst@mavt.ethz.ch](mailto:praktikantendienst@mavt.ethz.ch)

## 6.6 Contacts at Rectorate

Listed below are some of the most important weblinks and contacts. The Rectorate is responsible for the administration of teaching und hence for study in general, but not for the study programs in detail. [www.ethz.ch/students/en/studies/administrative.html](http://www.ethz.ch/students/en/studies/administrative.html)

### International Student Support

ETH Zurich, Main Building, HG F22.3, Phone: +41 44 632 20 95,

E-Mail: [international@rektorat.ethz.ch](mailto:international@rektorat.ethz.ch)

### Admissions Office

ETH Zurich, Main Building, HG F 21.2-21.5

Opening hours for Master students: Mon – Fri: 11:00 - 13:00

Phone: +41 44 632 93 96 ; +41 44 632 28 80 ; +41 44 633 91 78, E-Mail: [master@ethz.ch](mailto:master@ethz.ch)

### Registrar's Office

Registration, enrollment, semester on leave of absence

ETH Zurich, Main Building, HG F 19

Opening hours: Mon – Fri: 11:00 - 13:00

Phone: +41 44 632 30 00, Fax: +41 44 632 10 61, E-Mail: [registrar@rektorat.ethz.ch](mailto:registrar@rektorat.ethz.ch)

### Examinations Office

ETH Zurich, Main Building, HG F 18.1

Phone: +41 44 632 20 68, E-Mail: [exam@ethz.ch](mailto:exam@ethz.ch)

Opening hours: Mon – Fri: 11:00 – 13:00 or by appointment

## 6.7 Further Contacts and Weblinks

Internal Phone Directory of ETH Zurich

[www.ethz.ch/person-search](http://www.ethz.ch/person-search)

AMIV (Academic Association of Mechanical and Electrical Engineers, ETH)

[www.amiv.ethz.ch](http://www.amiv.ethz.ch)

Woko Studentische Wohngenossenschaft (Home for Students)

Sonneggstrasse 63, 8006 Zürich, [www.woko.ch](http://www.woko.ch)

Housing Office University Zurich and ETH Zurich

Sonneggstrasse 27, 8006 Zürich, [www.wohnen.ethz.ch](http://www.wohnen.ethz.ch)

Arbeitsvermittlung der Studentenschaft der Universität Zürich

[www.arbeitsvermittlung.unizh.ch](http://www.arbeitsvermittlung.unizh.ch)

Nightline Zürich

(Telephone hotline in the evening hours by students for students of Zurich University and ETH Zurich, Mon - Fri: 20:00 – 24:00), Phone: +41 44 633 77 77

E-Mail: [info@nightline-zuerich.ch](mailto:info@nightline-zuerich.ch) Webpage: [www.nightline-zuerich.ch](http://www.nightline-zuerich.ch)

ETH Zurich Ombudsman (help and mediation in case of conflict)

(Confidential qualified help in case of serious difficulties, conflicts and personal crises)

<https://www.ethz.ch/de/die-eth-zuerich/organisation/ombuds-und-vertrauenspersonen/ombudsstelle.html>

Psychological Counseling University Zurich and ETH Zurich

Phone: +41 44 634 22 80, E-Mail: [pbs@ad.uzh.ch](mailto:pbs@ad.uzh.ch)

[www.pbs.uzh.ch/index\\_en.html](http://www.pbs.uzh.ch/index_en.html)

## 7 Annex

### 7.1 Tutors

Name	Department	Institute/Lab	Web - Link
Buchli Jonas	MAVT	Agile and Dexterous Robotics Lab	<a href="http://www.iris.ethz.ch">www.iris.ethz.ch</a>
Buhmann Joachim M.	INFK	Machine Learning Laboratory	<a href="http://www.ml.inf.ethz.ch">www.ml.inf.ethz.ch</a>
D'Andrea Raffaello	MAVT	Inst. for Dynamic Systems and Control	<a href="http://www.idsc.ethz.ch">www.idsc.ethz.ch</a>
Dörfler Florian	ITET	Automatic Control Lab	<a href="http://www.control.ee.ethz.ch">www.control.ee.ethz.ch</a>
Gassert Roger	HEST	Rehabilitation Engineering Lab	<a href="http://www.relab.ethz.ch">www.relab.ethz.ch</a>
Hilliges Otmar	INFK	Advanced Interactive Technologies Lab	<a href="http://www.inf.ethz.ch">www.inf.ethz.ch</a>
Karlen Walter	HEST	Mobile Health Systems Lab	<a href="http://www.mhsl.hest.ethz.ch">www.mhsl.hest.ethz.ch</a>
Krause Andreas	INFK	Learning & Adaptive Systems Groups	<a href="http://www.las.ethz.ch">www.las.ethz.ch</a>
Lygeros John	ITET	Automatic Control Laboratory	<a href="http://www.control.ee.ethz.ch">www.control.ee.ethz.ch</a>
Nelson Bradley	MAVT	Multi-Scale Robotics Lab	<a href="http://www.iris.ethz.ch">www.iris.ethz.ch</a>
Pollefeys Marc	INFK	Visual Computing	<a href="http://www.ivc.ethz.ch">www.ivc.ethz.ch</a>
Riener Robert	HEST	Sensory-Motor Systems Lab	<a href="http://www.sms.hest.ethz.ch">www.sms.hest.ethz.ch</a>
Siegwart Roland	MAVT	Autonomous Systems Lab	<a href="http://www.asl.ethz.ch">www.asl.ethz.ch</a>
Smith Roy	ITET	Automatic Control Laboratory	<a href="http://www.control.ee.ethz.ch">www.control.ee.ethz.ch</a>
van Gool Luc	ITET	Computer Vision Lab	<a href="http://www.vision.ee.ethz.ch">www.vision.ee.ethz.ch</a>

## 7.2 Tutor Agreement



Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zürich

Department of Mechanical and Process  
Engineering

### Agreement between Master Tutor and Student – Master Curriculum

Last name	First name	Student ID

Master program: .....

Start of Master study: (HS/year, FS/year).....

Tutor: .....

LE-Nr.	Course title	HS/FS	ECTS
<b>Core Courses (36 ECTS)</b>			
<b>Multidisciplinary Courses (6 ECTS)</b>			



Semester Project (8 ECTS)	Title	Supervisor
Master Thesis (30 ECTS)	Title	Supervisor

Date: .....

Signature tutor: .....

Signature student: .....

**DMAVT**

ETH Zurich  
Department of Mechanical and Process Engineering  
Leonhardstrasse 21  
8092 Zurich

[www.mavt.ethz.ch](http://www.mavt.ethz.ch)

