

# MASTER

Department of Mechanical and Process Engineering

## Study Guide Master of Science ETH in Nuclear Engineering

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**ETH**

Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich

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## Introduction

The ETH Zurich offers together with the EPF Lausanne a specialized program to obtain the Master of Science and Technology ETH EPF in Nuclear Engineering. The Paul Scherrer Institute (PSI) contributes to the program by offering supervision and scientific infrastructure for semester and master projects as well as by providing additional academic personnel for lecturing. Other Institutions and Research Groups involved in the master's program are the Energy Science Center (ESC) at ETHZ and the Energy Center (CEN) at EPFL. The program gets financial support by the Competence Center Energy and Mobility (CCEM-CH) of ETH-Domain and [swissnuclear](#), the nuclear energy section of swisselectric.

The leading house of the master's program in Nuclear Engineering at ETH Zurich is the Department of Mechanical and Process Engineering (D-MAVT); the leading house of the master's program in Nuclear Engineering at EPFL is the Section of Physics (SPH). The program prepares students for the diversity found at the frontiers of research and industrial development in the field of nuclear technology.

This master's study guide provides detailed information relating to the "Study Rules for the Master in Nuclear Engineering" RSETHZ324.1.0300.30 (in German) and illustrates some procedures and contacts at ETH Zurich.

## 1 Master's program

The overall objectives of the Master of Science in Nuclear Engineering program are to:

1. Provide in-depth knowledge on the fundamentals and technology of harnessing nuclear fission for energy supply
2. Provide complementary knowledge on nuclear fusion
3. Provide knowledge on nuclear techniques in medicine, research and industry
4. Provide a view on the complete nuclear energy conversion system and the entire fuel cycle from uranium mining to the back-end
5. Integrate nuclear energy into energy systems as a whole

The master's program in Nuclear Engineering follows the main structure of specialized master's programs offered at ETH Zurich by the Department of Mechanical and Process Engineering and at EPF Lausanne by the Section of Physics. Some specifics arise from the multidisciplinary character of the subject and from involving teaching offers from both federal schools. Students will have to follow lectures at EPFL in the first semester and at ETHZ in the second semester, corresponding to the special background of the involved professorships at both schools. The third semester is dedicated to the master project, which usually will be carried out at the Paul Scherrer Institute, where a strong research infrastructure is available.

### 1.1 Tutor System

The Master of Science in Nuclear Engineering is a tutor-driven program. At the very outset, students choose an authorized member of the Nuclear Engineering Core Group as academic tutor and advisor for the duration of the program. This tutor advises the student in the choice of optional courses, i.e. in the definition of an individualized curriculum that, while ensuring top-class specialized education, also takes into consideration talents and expectations of the student. The final individual curriculum is approved by the tutor. Furthermore, the tutor coaches the students throughout the program, monitoring the progress and, if required, proposes necessary adjustments to enhance the performance.

All professors of the Nuclear Engineering Core Group, who are involved in teaching and research related to one or more aspects of nuclear energy, including its complementarily and synergy with other energy systems, are authorized to act as tutors (see Annex 7.1).

The tutor can be changed if there are cogent reasons, if both tutors agree and the Director of Studies approves it.

In addition to the program tutors and other professors, the teaching faculty includes leading scientists and researchers from the Nuclear Energy and Safety Research Department of the Paul Scherrer Institute, as well as senior professionals from industrial companies and governmental organizations.

## **1.2 Tracks**

To provide orientation for prospective students and to help in the selection of tutors, the program's elective courses are categorized into three tracks:

Track Option A: Energy Systems

Track Option B: Physics and Materials

Track Option C: Thermal-hydraulics

The tracks are primarily meant to guide the students in the choice of elective courses and are not equivalent to different specializations. They serve as the starting point for planning an individualized curriculum, but students are free to choose optional courses from more than one track. The students make their choices in consultation with the tutor.

## **1.3 Curriculum Structure**

The student workload required to achieve the objectives of the program is measured in credit points, according to the European Credit Transfer and Accumulation System (ECTS). A minimum of 90 credits are required for the master's degree, including 28 credits from the compulsory courses and 30 credits from the master's thesis.

Tutors help define a curriculum for each student, structured in following categories. In every category a given number of credit points must be gained.

<b>Core courses</b>	48 credits: 28 credits compulsory 20 credits elective
<b>Elective course</b>	6 credits: 4 credits, elective 2 credits, course in entrepreneurship
<b>Semester project</b>	6 credits
<b>Master's thesis</b>	30 credits

The first (autumn) semester of the MSc in Nuclear Engineering takes place at EPFL. The second (spring) semester takes place at ETH Zurich. The master's thesis in the third semester is in general carried out at a lab of the Paul Scherrer Institute in Villigen under the supervision of a professor of EPF Lausanne or ETH Zurich, or directly at EPFL or ETHZ.

The start of the master's program in Nuclear Engineering is in the autumn semester. In cases the admission committee requires credits from additional courses to fulfill the admission requirements, students may start in the spring semester to attend the required additional courses.

### 1.3.1 Core Courses

The core courses lay the foundation of the master's program in providing students with core knowledge according to the program's goals and the qualification profile.

There are seven compulsory courses (28 credit points), each of which must be passed to obtain the master's degree:

- \* Neutronics (4 ECTS)
- \* Reactor Experiments (4 ECTS)
- \* Reactor Technology (4 ECTS)
- \* Nuclear Fuels & Materials (4 ECTS)
- \* Nuclear Safety (4 ECTS)
- \* Special Topics in Reactor Physics (4 ECTS)
- \* Nuclear Energy Systems (4 ECTS)

An additional 20 credits are covered by five elective core courses, chosen from the following tracks:

- \* Track Option A: Energy Systems
- \* Track Option B: Physics and Materials
- \* Track Option C: Thermal-hydraulics

The students may choose the five elective courses from more than one track in agreement with the tutor, who can explain the orientation implied by each course.

### **1.3.2 Elective Courses**

Students are free to choose one course of 4 credit points from the complete course catalogue at Master's level either at EPF Lausanne or at ETH Zurich. This free elective course, which is chosen in consultation with the tutor, can either serve to deepen scientific and technical knowledge related to the chosen specialization area, or to complement the range of skills acquired with those in other disciplines (economics, management, humanities, etc.).

At least one course in entrepreneurship has to be selected and serves to broaden the general education. Students must select one course (min. 2 credits) in entrepreneurship during the first semester, from among the courses offered by EPFL's teaching programs in Management of Technology and Entrepreneurship (MTE), or Humanities and Social Sciences (SHS). They can also take an equivalent course at the University of Lausanne.

The other free elective is chosen in consultation with the tutor and may be selected among the complete course catalogue of ETH Zurich and EPF Lausanne. The following are a few examples of free electives:

At EPFL:

- \* Advanced Fossil and Renewable Energy Systems
- \* Hydraulic Turbomachines
- \* Nuclear Fusion and Plasma Physics
- \* Introduction to Particle Accelerators
- \* Instability and Turbulence
- \* Two-Phase Flows and Heat Transfer

- \* Turbomachines thermiques
- \* Advanced Energetics and Engines

At ETH Zurich:

- \* Risk Analysis and Engineering of Highly-Integrated Systems
- \* Renewable Energy Technologies II
- \* Energy Storage and Conversion Information
- \* Advanced CFD Methods
- \* Multiphase Flow Information
- \* Advanced Topics in Nuclear Reactor Materials
- \* Radioisotope and Radiation Applications
- \* Computational Multiphase Thermal Fluid Dynamics

### **1.3.3 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 engineering problems.

The tutor proposes the subject of the project, elaborates the project plan, defines the roadmap together with their students and monitors the overall execution, if the project is carried out in another lab. Dates for completion of the project and the criteria for assessment are set by the tutor.

The project is realized in 180 hours concluded with a written report and a presentation. 6 ECTS are awarded for successful completion. If the semester project is not passed, a new topic must be defined.

### **1.3.4 Industrial Internship**

The Core Group of the master's program in Nuclear Engineering has decided that the industrial internship is necessary part of the preparation to the master project. The aim of the internship is to bring the student in contact with the professional work environment in the industry. It is part of the master project. During this period, the student will have the opportunity to be involved in ongoing projects at the host institution. It can be carried out

in a Swiss or a foreign company in the field of Nuclear Engineering or on the basis of a previous agreement with the tutor it could be performed in a research laboratory. The students can organize independently their internship or they can ask the tutors for advice and support. The tutors will help to establish the contact with the industrial enterprise and discuss tasks, work plans and results.

The internship must be at least 8 weeks long and can be carried out during the study. The timing has to be discussed with the tutor.

Detailed requirements may be found in the regulations (Praxisreglement 2008 für das Industriepraktikum im Master-Studiengang Nuclear Engineering, in German).

Each student has to complete the following steps:

- work in a company or a research institute for at least eight weeks,
- present a report concerning the activities, information about the company, tasks performed, etc. The activity report must be signed from the supervisor at the company,
- receive a letter of confirmation from the company

The student must submit the confirmation letter and the activity report to the D-MAVT Student Administration which checks the content, approves it and recognizes it in the transcript of the student (Addendum).

### **1.3.5 Master's Thesis**

The master's thesis concludes the master's program. It provides evidence of a student's ability to apply in a scientifically structured and independent manner. The master's thesis is either closely related to the research activity of the tutor or deals with a challenging theme faced by industry. The tutor is responsible for monitoring the structure and quality of the thesis.

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

- have obtained a bachelor degree;
- have fulfilled all specified admission conditions;

- have acquired at least 44 ECTS in core courses and 6 ECTS corresponding to the semester project

The master's thesis involves a workload of 30 ECTS. The credits are granted with credits and a grade upon successful presentation of the master's thesis and an oral presentation of the results. In general, the master's thesis is pursued in one of the research laboratories of the Nuclear Energy and Safety Department (NES) at PSI, the ETH Domain's research institute which is Switzerland's main player in nuclear (fission) energy related R&D. Master's thesis supervisor can be a professor at ETH Zurich or Lausanne or a senior NES scientist, under academic mentorship of the responsible professor, who proposes the subject of the master's thesis, dates for completion and the criteria for assessment, and defines the roadmap together with the student.

Alternatively, master's projects can be accomplished in the Laboratory of Nuclear Energy Systems at ETH Zurich or in the Laboratory of Reactor Physics and Systems Behaviour at EPFL. The definition of the work plans for each master's project, as also its accomplishment, is monitored by the responsible professor.

If a master's thesis is not successfully completed, a new topic must be defined.

#### **1.4 Duration and Terms**

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

If admission to the master's program is granted upon the condition of obtaining additional ECTS, the maximum duration is extended. Such requirements apply to students who must earn additional credit points during the master's program, as decided by the admission committee.

Missing ECTS	Extension
21-30	0.5 Year
31-60	1 Year

Extended duration of study due to admission requirements

The Rector may approve an extension of the study duration under special circumstances. Requests must be presented to the D-MAVT Student Administration.

For the accomplishment of the industrial internship and the master project, fixed terms are defined. The normal period for an industrial internship starts at the beginning of the third semester and ends after 8 weeks of work in the industrial company. The master project starts with the beginning of week 9 of the third semester. The master's thesis has to be submitted to the supervising professor 25 weeks after the start of the third semester. The students receive a written topic and task description for their master project by start of the third semester. The exact dates may vary due to the change of the academic calendar and will be published prior to the start of the semester. The schedule of the master project can be changed for important reasons and with approval of the Core Group.

Students may choose longer periods for their industrial internships in agreement with their individual tutors. Such extensions should preferably be made by an earlier start of the internship in the summer period.

## 1.5 Language

The Master's language is English.

## 2 Performance Assessment

A performance assessment is required for all courses of the program. The type of assessment is defined by the person in charge of the course. For example, assessment can be made through exercises, projects, speeches 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.

### 2.1 Grading Scale

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 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

## 2.2 Credit Points

Swiss universities award credit points (cp) under the European Credit Transfer and Accumulation System (ECTS). This system is utilized in Europe and it should assist in comparing European universities and promote mobility between these universities.

The ECTS credit system is based on the workload of a student. 60 ECTS are equivalent to a full-time study of one year (about 1800h). Therefore, 1 ECTS corresponds to a 25 - 30 h 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 award 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)

## 2.3 Confirmation of Course Attendance

A confirmation of course attendance (Testat) affirms the fulfillment of requirements (completing exercises, attending tests or lectures, etc.).

In many courses, a confirmation of course attendance is necessary before completing the performance assessment. It is the student's responsibility to check towards the end of the semester on → [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch) whether they were issued all necessary confirmations of course attendance. If a confirmation of course attendance is missing, students are responsible to contact the appropriate lecturer. Students, who cannot produce the necessary confirmation of course attendance, will be automatically dropped from the examination.

Students with additional requirements or the bachelor's level could be exempt from the course attendance confirmation.

## 2.4 Examinations

Master's examinations are conducted individually. Only additional requirement courses can be examined within an examination block.

At ETH 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 Examination 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 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. These dates are also announced by the lecturers offering the course. Students must register for a repetition date using the online enrollment; this is only possible once the results have been officially published by the Administration Office.

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 performance may be graded or ungraded. No separate registration is required for this form of performance assessment. However, students must enroll in the respective course. The student must register for the examination during the third and fourth week of each semester:

- [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch)
- [www.rektorat.ethz.ch/students/exams/bsc\\_msc/registration/index\\_EN](http://www.rektorat.ethz.ch/students/exams/bsc_msc/registration/index_EN)
- [www.rektorat.ethz.ch/calendar/index\\_EN](http://www.rektorat.ethz.ch/calendar/index_EN)

For every course information on the examination mode can be found in the course catalogue:

- <http://www.course-catalogue.ethz.ch>

Information about the examinations for every course is given in the course catalogue in the category “Performance assessment information“:

<b>ECTS credits</b>	<i>Number of ECTS 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>Yes / No</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>Mode of examination</b>	<i>Oral / written; duration</i>
<b>Examination aids</b>	<i>Pocket calculator, compendium, etc. ...</i>
<b>Additional requirements</b>	

Information about examinations in the course catalogue

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

Master’s examinations are always single. The tests are written or oral.

The provisional specifications are on the personal examination plan, which is published on → [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch) about four weeks (Spring semester) respectively six weeks (Autumn semester) before the end of the semester.

## 2.5 Master’s Degree

After gaining all required credit points in total and in each category, students can file a diploma request on → [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch). After classifying possible additional

courses into final academic record and addendum, students must print the diploma request, sign it and submit it to the Student Administration.

The following prerequisites must be completed:

- All credit points from the four categories have been obtained.
- The list of core courses corresponds with the student's master curriculum signed by the tutor.
- The application takes place within three years after beginning the master's program.

When these points have been fulfilled, the master's degree will be conferred and the student may assume to wear the title of:

### **Master of Science EPF ETH in Nuclear Engineering**

The degree certificate is issued jointly by EPFL and ETH Zurich.

Students may have 100 ECTS recognized for the master's degree, whereas 4 ECTS may be recognized in courses in humanities, social and political sciences. Additionally obtained credit points may be listed, at student request, on the addendum of the final academic record (Addendum Master's Degree – Academic Record Translation).

The grade point average of the master's degree is composed as a weighted average of all grades associated with the ECTS as weight

- Core courses (compulsory and elective): 48 ECTS
- Elective courses: 6 ECTS
- Semester project: 6 ECTS
- Master's thesis: 30 ECTS

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

### 3 Program Requirements, Application and Enrollment

The joint Master of Science in Nuclear Engineering program has a strongly interdisciplinary nature and students can apply to the program on the basis of a bachelor's degree in a broad range of basic and engineering sciences, for example:

- \* Chemical Engineering
- \* Chemistry
- \* Electrical Engineering / Electrical Engineering and Information Technology
- \* Mechanical Engineering
- \* Materials Science
- \* Mathematics
- \* Physics

Candidates for the master's program must present proof of specialized knowledge and abilities in the fields of science and engineering. These skills are a minimum requirement and serve as a basis for the admission process. To be admitted, students must meet the following requirement profile, largely covered by the common elements of the first 2 years of an university education in science and engineering:

- Minimum required credits in Mathematics: 18 ECTS e.g. Analysis I + II + III
- Minimum required contents in Natural Sciences: 12 ECTS, e.g. Physics I + II
- Minimum required contents in Engineering Sciences: 12 ECTS, e.g. 6 ECTS each from two of the following: Mechanics, Electrical Engineering, Thermodynamics, Chemical Engineering, Materials Science, Control Systems

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

- Assessment of the profile
- Performances and Grades
- References letters
- Motivation letter

- Command of English (TOEFL or other recognized language tests)
- Test (GRE)

The evaluation of the bachelor's degree is made based on the corresponding Bachelor of Science degree from EPFL or ETH Zurich. Admission is made based on an individual evaluation of the application file (evaluation sur dossier) to establish whether students have sufficient prerequisite courses in the bachelor's degree.

Students whose bachelor's degree does not fully meet the Requirement Profile can be admitted with the requirement to obtain additional credits from bachelor courses. 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 under the condition of taking a minimum of 40 ECTS, up to maximum 60 ECTS of additional courses. The additional requirements depend on the specialization at the Swiss University of Applied Sciences.

Students in this category can be admitted with or without additional requirements, but they may be rejected as well. The rector's office will inform the students about the decision in writing.

### **3.1 Application**

The rector's office receives all applications, which are submitted online using the web-based application-tool eApply. The application form and detailed information about the application can be found on the web:

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

Information/guidance: → [www.admission.ethz.ch/master](http://www.admission.ethz.ch/master)

ETH students have to apply to for the Master in Nuclear Engineering, online in the admission category "[Graduates of ETH Zurich](#)".

## 3.2 Registration and Enrollment

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

→ [http://www.admission.ethz.ch/master/how\\_to\\_apply](http://www.admission.ethz.ch/master/how_to_apply)

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

Students from ETH Zurich that 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)

### 3.2.1 Visa

Students can apply for the master's program either at ETHZ or at EPFL.

The first semester (autumn) takes place in Lausanne (Canton Vaud) and the second semester (spring) in Zurich (Canton Zurich), so students have to get a visa resp. a residence authorization for each semester for each canton.

As in the third semester students are free to choose, where they want to carry out their master's thesis, it is important, that they still apply for a residence authorization in the Canton of residence.

Students have to contact the Student Administration every semester to define the registration of the following semester.

For questions concerning the residence authorization, students can contact:

Annina Wanner

HG FO 21.3

Phone: +41 44 632 20 95

Fax: +41 44 632 11 17

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

## 4 Useful Information about ETH Zurich and EPF Lausanne

### ETH Zurich

Approximately 380 professors and 4600 research and support staff are responsible for the education and research training of 13,000 undergraduate and graduate students at ETH Zurich. 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. The most famous graduate of ETH was none other than Albert Einstein, one of twenty-one Nobel Prize Winners to have been associated with ETH as student or during their professional careers.

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 Joint Masters programme in Nuclear Engineering spend most of their time at the central campus.

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

The leading house of the master's program in Nuclear Engineering at ETHZ is the Department of Mechanical and Process Engineering D-MAVT.

The Department of Mechanical and Process Engineering one of the largest ETH departments has approximately:

- 1500 undergraduate and graduate students
- 329 PhD candidates
- 30 professorships
- 506 staff members

## **EPF Lausanne**

Located in full view of the Alps on the north side of Lake Geneva, in one of Europe's most beautiful places, EPFL is home to 6500 students, a number that has increased by 70% since 1990. With state-of-the-art facilities in a single campus, bright, motivated students, and an outstanding faculty, EPFL's reputation as a top-rate teaching and research institution continues to grow. There are over 110 nationalities represented on campus. With 50% of its faculty recruited internationally and 65% of the PhD students coming from abroad, EPFL is one of the most international universities in the world. The campus is structured to foster innovation and interdisciplinary research, and students benefit from this atmosphere as their skills and interests evolve.

[www.epfl.ch](http://www.epfl.ch)

The leading house of the master's program in Nuclear Engineering at EPFL is the Section of Physics SPH.

### **4.1 Zurich**

A versatile offering of sports, cultural, and leisure activities provides a welcome complement to the intense and demanding student life. Zurich is an attractive city with an extremely high standard of living. Although relatively small, with 360,000 inhabitants, Zurich has a metropolitan flair, excellent sports facilities, an extensive range of cultural and recreational offerings – and a very vibrant nightlife. The beautiful location at the end of Lake Zurich makes the city very pleasant in the summer and winter. The nearest ski slopes are less than an hour away.

### **4.2 Lausanne**

Lausanne, the capital of Canton Vaud, lies on Lake Geneva in the French-speaking area. Its population of 135,000 includes some 25,000 students. Lausanne plays a major role in the field of international sport. In particular, as it houses the headquarters of the International Olympic Committee (IOC), it has earned the title of "Olympic Capital". The town is charac-

terised by its steep streets and the over 500 m difference in level between the shores of Lake Geneva and the city's heights.

### **4.3 Tuition and Cost of Living**

Students should budget between CHF 20.000,-- and 22.000,-- (Euro 13.000,-- to 14.500,--) per year for tuition and cost of living. This covers tuition and student fees (CHF 640,-- per semester, as higher education is publicly funded in Switzerland), accommodation, subsistence, health insurance and other personal costs.

### **4.4 Maps and Directories**

#### **City Guide of Zurich**

→ <http://www.stadtplan.stadt-zuerich.ch/zueriplan/stadtplan.aspx>

#### **Location of ETH Zurich**

→ [http://www.ika.ethz.ch/services/eth\\_plaene/zurich.pdf](http://www.ika.ethz.ch/services/eth_plaene/zurich.pdf)

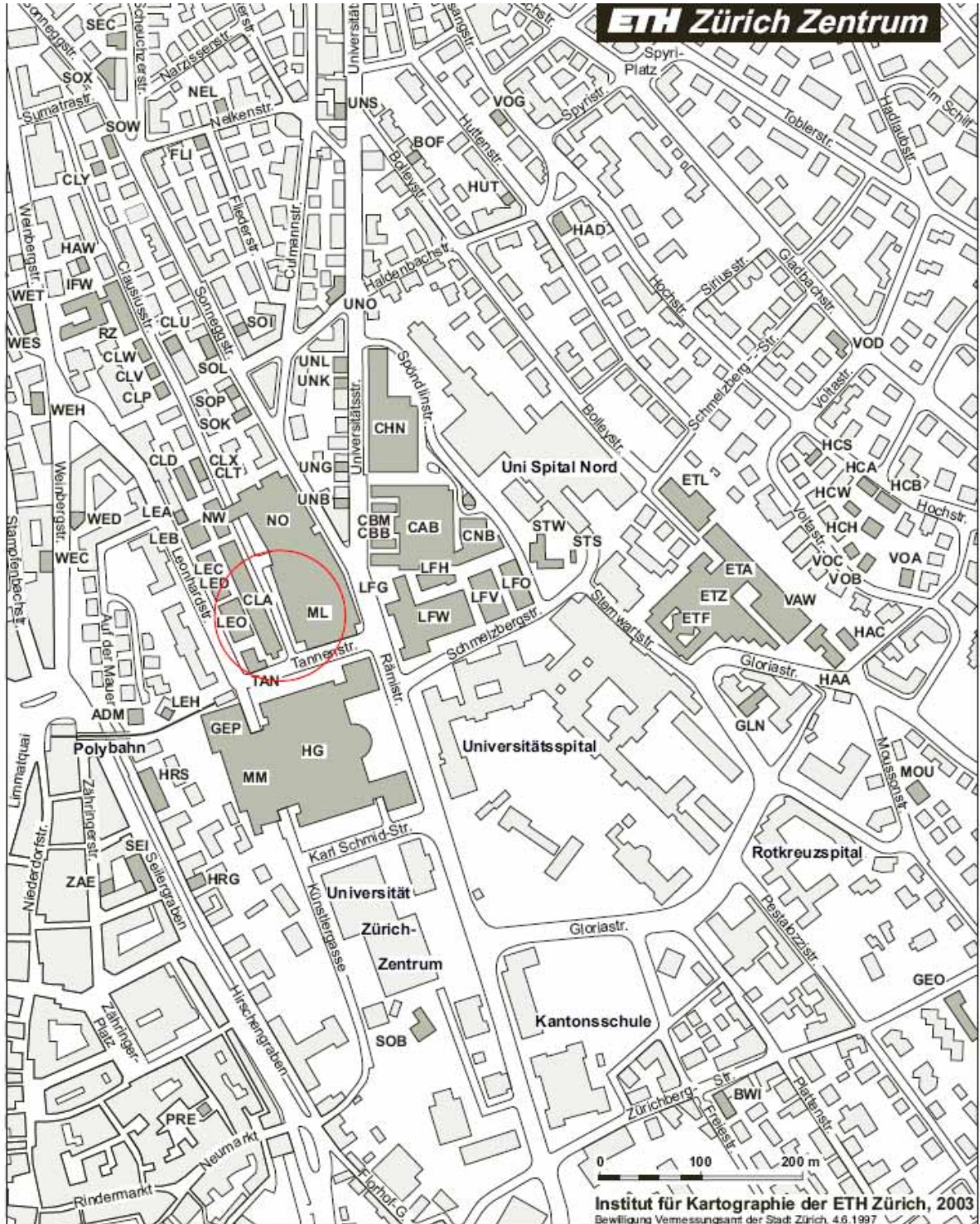
#### **Location of ETH Lausanne**

→ [http://www.ika.ethz.ch/services/eth\\_plaene/zurich.pdf](http://www.ika.ethz.ch/services/eth_plaene/zurich.pdf)

## ETH Building map

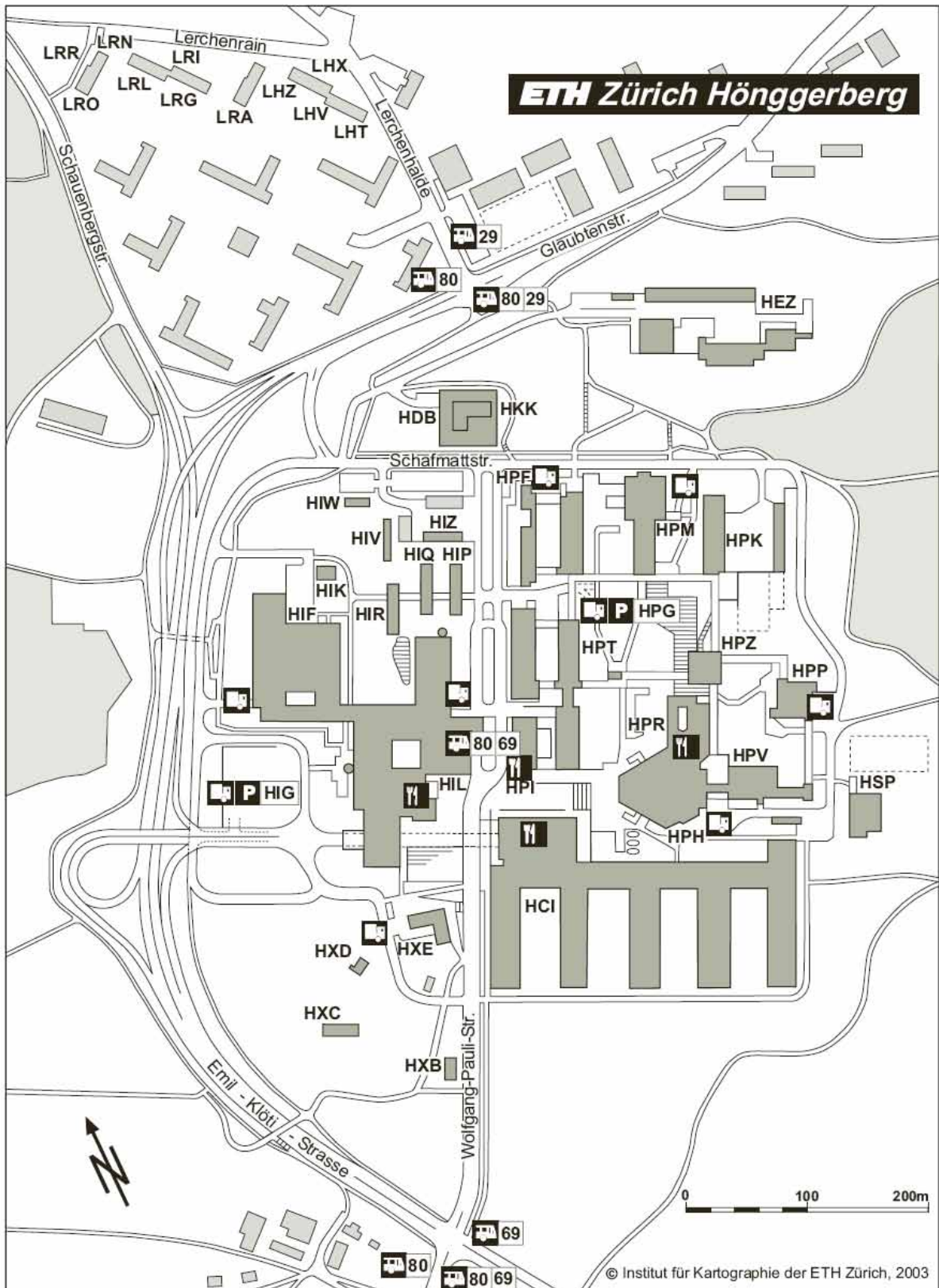
Location of D-MAVT and ETH-Main Building

→ [http://www.mavt.ethz.ch/about/wegbeschreibung/Wegbeschreibung\\_EN.pdf](http://www.mavt.ethz.ch/about/wegbeschreibung/Wegbeschreibung_EN.pdf)



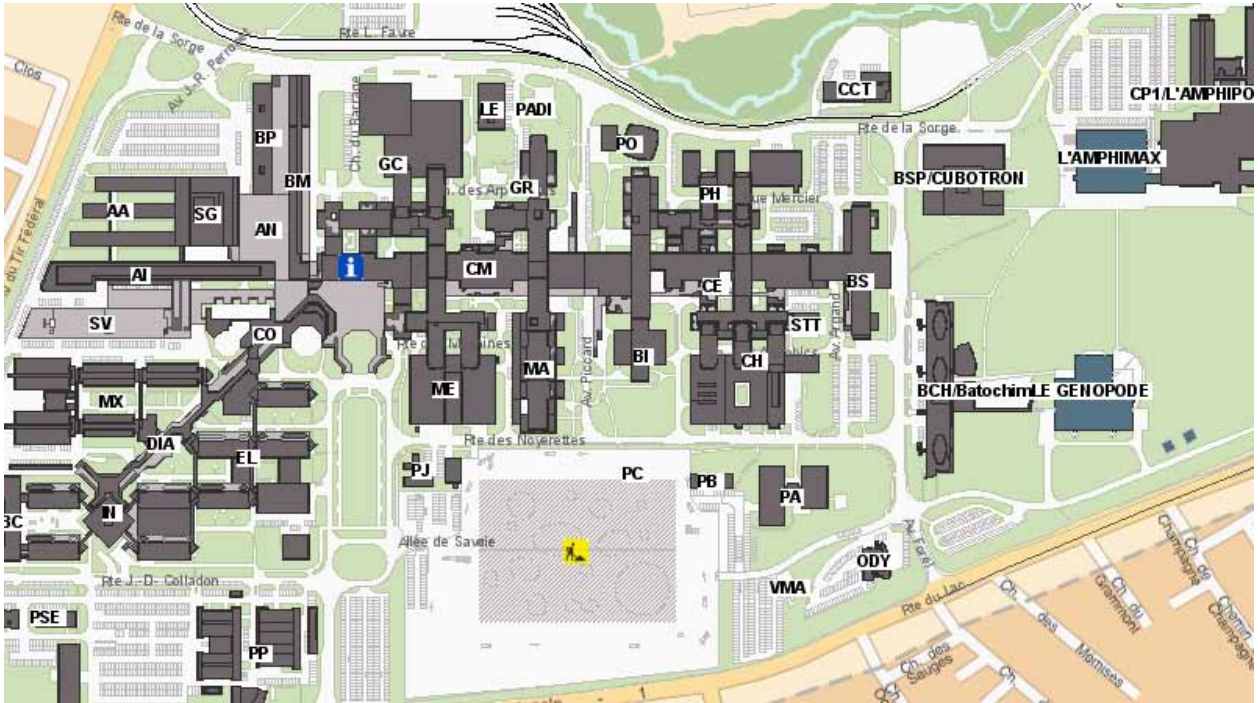
Location of ETH Hoenggerberg

→ [http://www.ika.ethz.ch/services/eth\\_plaene/honggi.pdf](http://www.ika.ethz.ch/services/eth_plaene/honggi.pdf)



Location of EPFL

→ [http://plan.epfl.ch/?reset\\_session&recenter\\_bbox=531983,151824,534097,153012](http://plan.epfl.ch/?reset_session&recenter_bbox=531983,151824,534097,153012)



## 4.5 Contact at D-MAVT

General information about the Department Mechanical and Process Engineering:

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

Department Coordination and Student Administration  
ETH Zurich  
ML K 44  
Sonneggstrasse 3  
CH-8092 Zurich

E-mail: [info@mavt.ethz.ch](mailto:info@mavt.ethz.ch)  
<http://www.master-nuclear.ch/index>

General questions, administration, examination:

Student Administration:

Ms. Kerstin Fischer	<a href="mailto:kerstin.fischer@mavt.ethz.ch">kerstin.fischer@mavt.ethz.ch</a>	Phone: +41 44 632 24 57
Ms. Agnes Rupacher	<a href="mailto:agnes.rupacher@mavt.ethz.ch">agnes.rupacher@mavt.ethz.ch</a>	Phone: +41 44 632 24 52
Ms. Dr. Maddalena Velonà	<a href="mailto:velona@mavt.ethz.ch">velona@mavt.ethz.ch</a>	Phone: +41 44 632 21 99

ETH Zentrum, ML K 44  
Fax: +41 44 632 14 83

Opening hours:

During the semester:	Tue: 9:00 – 13:00 and Wed – Fri 9:00 – 12:00
During the semester break	Tue – Thu: 9:00 – 12:00

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

Maddalena Velonà	<a href="mailto:velona@mavt.ethz.ch">velona@mavt.ethz.ch</a>
Kerstin Fischer	<a href="mailto:kerstin.fischer@mavt.ethz.ch">kerstin.fischer@mavt.ethz.ch</a>

ETH Zentrum, ML K 44

Consultation by appointment

## 4.6 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 the study in general, but not for the study programs in detail.

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

### Registrar's Office

Registration, enrollment, semester on leave of absence

ETH Zentrum, HG F 19

Phone: +41 44 632 30 00, Fax: +41 44 632 10 61

[registrar@rektorat.ethz.ch](mailto:registrar@rektorat.ethz.ch)

### Examination Office

ETH Zentrum, HG F 18.1

Phone: +41 44 632 20 68

[exam@ethz.ch](mailto:exam@ethz.ch)

### International Student Support

Tel. +41 44 632 20 95

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

## 4.7 Further Contacts and Weblinks

Internal Phone Directory of ETH Zurich

[http://www.ethz.ch/people/index\\_EN](http://www.ethz.ch/people/index_EN)

**AMIV (Academic association of mechanical and electronical engineers ETH)**

[www.amiv.ethz.ch](http://www.amiv.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 from students for students of the University Zurich and ETH Zurich, Mon-Fri 20:00-24:00)

Phone: +41 44 633 77 77

[nightline@vseth.ethz.ch](mailto:nightline@vseth.ethz.ch)

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

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

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

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

**Psychological counseling University Zurich and ETH Zurich**

Phone: +41 44 634 22 80

[pbs@ad.unizh.ch](mailto:pbs@ad.unizh.ch)

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

**Housing Office University Zurich and ETH Zurich**

Sonneggstrasse 27, 8092 Zürich

Phone: +41 44 632 20 37

[zimmervermittlung@ethz.ch](mailto:zimmervermittlung@ethz.ch)

[www.wohnen.ethz.ch/index\\_EN](http://www.wohnen.ethz.ch/index_EN)

**WOKO Studentische Wohngenossenschaft Zürich**

Leonhardstrasse 15, 8001 Zürich

Phone: +41 44 632 42 90

[woko@woko.ch](mailto:woko@woko.ch)

[www.woko.ch](http://www.woko.ch)

## 5 Annex

### 5.1 Tutors

#### **Prof. Rakesh Chawla**

EPFL, Section of Physics, Laboratory of Reactor Physics and Systems Behaviour

PSI, NES, Laboratory of Reactor Physics and Systems Behaviour

<http://lrs.epfl.ch/>

Focus: Reactor Physics, Nuclear Systems Behaviour, Fast Reactors

#### **Prof. Wolfgang Kröger**

ETHZ, D-MAVT, Laboratory of Safety Analysis

<http://www.lsa.ethz.ch/>

Focus: Energy Systems, Reactor Safety

#### **Prof. Horst-Michael Prasser**

ETHZ, D-MAVT, IET, Laboratory of Nuclear Energy Systems

PSI, NES, Laboratory of Thermal Hydraulics

<http://www.lke.mavt.ethz.ch/>

Focus: Energy Systems, Thermal Hydraulics, Reactor Safety

#### **Prof. Minh Quang Tran**

EPFL, Section of Physics, Centre de Recherches en Physique des Plasmas

<http://crppwww.epfl.ch/>

Focus: Physics and Materials, Plasma Physics, Fusion Technology



ETH Zurich  
Department of Mechanical & Process Engineering  
Sonneggstrasse 3  
8092 Zurich  
Switzerland

**DMAVT**

Departement Maschinenbau & Verfahrenstechnik  
Department of Mechanical & Process Engineering