

Geomatics

Master of Science ETH

47°24'41.2"N 8°30'32.9"E

28°37'20.0"N 77°13'40.2"E

32°53'18.0"N 13°11'29.5"E

37°45'21.6"N 25°38'34.0"W



Master of Science ETH in Geomatics

If you are interested in geospatial data modeling, in how such data can be acquired and in how it can be used to understand the world around us, then Geomatics may be exactly the right choice for you.

➔ **ETH Zurich**, one of the best universities in the world, offers an exciting, course-based ➔ **Master's programme in Geomatics**. Teaching and learning are closely connected to cutting-edge research through project-based learning with a faculty of internationally recognised leaders in their respective fields.

Students usually take two years to complete this programme. They have many options to choose from. These comprise electives for individual specialisation and preferred topics for projects and the Master's thesis. A personal tutor helps the students navigate these options to identify sensible choices given the respective background, interests and career preference. At ETH the students meet outstanding and highly motivated people including devoted teachers and researchers, highly skilled and supportive staff, and excellent students from all over the world. ETH provides fantastic facilities for studies and research, from

high-performance computing clusters to specialist labs and the latest sensors and instruments.

So what about you?

Obtaining an MSc in Geomatics from ETH may be the perfect next step for you to prepare your future career in a challenging and rewarding academic, industrial or business environment. At the same time, you are likely to make friends with smart and interesting people, many of them future leaders just like you. And finally, you will experience one of the best cities to live in, first hand. ■

The Master's degree programme

Geomatic engineering is a very broad discipline. It comprises geographic information science and cartography, geodesy and navigation, cadastral and land surveying, engineering geodesy and geomonitoring, remote sensing and photogrammetry. Society needs experts in each of these areas but it also needs engineers with abilities in several of them for interdisciplinary collaboration with other trades and disciplines.

Career Booster

The Master's degree programme in Geomatics at ETH prepares students well for successfully facing challenges in their future careers. Building upon a BSc in geomatic engineering or a related area such as geodesy, surveying or geospatial engineering, it allows students both to broaden and deepen their expertise in geospatial data acquisition, data analysis and visualisation. Additionally, vital transferable skills such as teamwork, critical thinking, problem solving, communication and scientific working are fostered through projects, lab work and courses which expose students to cutting-edge scientific research and advanced methods, as well as to real-world situations and case studies.

Customisation possibilities

Students find ample opportunity to customise the programme to their specific needs or interests by selecting individual courses

offered in a variety of geomatics areas, such as: Engineering Geodesy, Photogrammetry and Remote Sensing, Space Geodesy, Geographic Information Science, Cartography, Spatial Planning.

Extra-curricular activities

The student-to-faculty ratio is outstanding. Students who want to participate actively in research work or teaching even during their studies can easily approach professors and scientific staff. This provides great learning experiences and creates unique opportunities for personal development, and for starting to build a professional network. While such extra-curricular activities are not necessary to get the right job quickly after graduation, they further strengthen the student's profile, and they are fun. ■



Structure and content of the programme

The Master's degree programme in Geomatics is a full-time study programme. It is course-based, but offers lots of opportunities for hands-on experience and individual specialisation. It also comprises research-oriented work through projects, the Master's thesis with guidance from doctoral students, postdocs and professors.



The programme is in English, but there is an option to take some courses in German. The standard period required to complete it is four semesters. Each semester lasts 14 weeks and is followed by a period of several weeks for self-study and examinations. The workload is measured in ECTS credit points. The full programme comprises at least 120 credits, typically 30 per semester. On average, one credit corresponds to 30 hours of studying.

Four mandatory courses in the first semester cover important methodological foundations in the areas of computational methods, data acquisition, reference systems, and research methods. Apart from these courses, each student shapes her/his own program by choosing within a catalogue of electives specific to geomatics. These comprise at least 40 credits and thus represent more than 30% of the master studies. A professor supports the

student as a personal tutor in selecting appropriate electives. In the second and third semester, the students work on two different projects, usually in teams. This helps them to further develop a variety of domain specific, technical, social and personal skills. Within the projects they also gain further experience with scientific working, which prepares them for the one-semester master's thesis. To round off their individual program, students choose freely from a list of Science-in-Perspective courses, and from the entire course catalogue of ETH Zurich and even the University of Zurich in order to broaden or further specialise their academic education individually. These courses contribute more than 30% of the credits. Domain specific specialization is possible in the following areas:

→ Engineering Geodesy

Recording, analysis and interpretation of data that describe the geometry, state and dynamics of structures ranging from small (e.g., machine parts) to large scales (e.g., dams, rock falls).

→ Photogrammetry and Remote Sensing

Measurement, analysis and mapping based on image data, from close-range photographs to satellite imagery, using advanced data science and machine vision.

→ Space Geodesy

Data acquisition, analysis and interpretation for geodetic Earth observation and global positioning, with a focus on space-based technologies.

→ Geoinformation Engineering

Management, modelling, analysis and visualisation of spatio-temporal data and decision processes, with a particular focus on geographic information systems (GIS) and mobile technologies.

→ Cartography

Visualization and cartographic representation of spatial data. Creation of static and dynamic maps, use of multimedia technologies and interactive displays.

→ Spatial Planning

Development of landscapes, living spaces and transport systems. Planning processes to reconcile ecological, social and economic needs and constraints, and facilitate decision-making. ■

Excellent career prospects

Once they leave us, qualified as Master of Science ETH in Geomatics, our graduates are heading for an exciting and varied career. A wide range of professions is open to them.

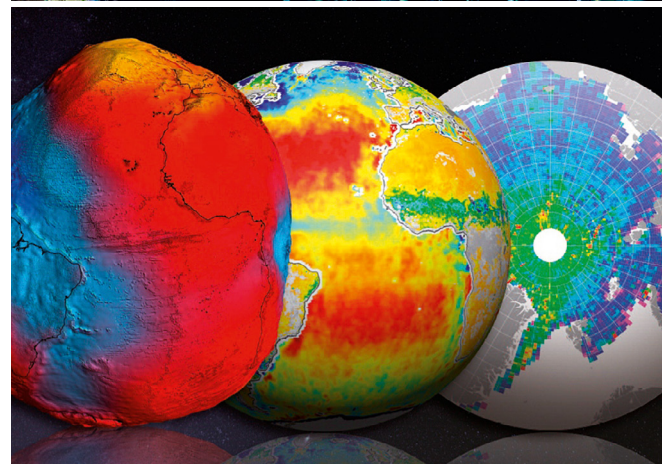
Connections to the private sector

Even during their studies, the students will have enjoyed the opportunity to get connected with the private sector and interact with potential employers. The strength and reputation of the ETH geomatic engineering group's research attract collaboration with businesses and industry from around the world. Collaborators include highly innovative local players together with internationally famous names such as ESRI, THALES, Swisstopo or Leica Geosystems.

A wide range of potential employers

Due to ETH's recognised brand, sound training and in particular the development of cross-disciplinary competences, ETH graduates are predestined, right from an early stage in their professional careers, to take on positions of responsibility. Regardless of whether they have a particular interest in technology or whether their primary focus is more on communication and processes, whether they prefer details and planning or conceptual work and management, exciting challenges lie ahead in a wide range of sectors and with a large number of potential employers both in Switzerland and abroad, such as

- Geomatic engineering, planning, consulting and engineering practices
- Transport, telecommunication and energy supply companies
- Construction and real estate companies
- Instrument and software manufacturers, industrial and mechanical engineering companies
- IT and high-tech corporations
- Banks and insurance companies
- National and international authorities, organisations and research institutions.



Studying at ETH

The **➔life of a student at ETH Zurich** can be intensive and demanding – but also highly rewarding and exciting. Anyone who organises their studies properly will have time for sports or musical activities, for pursuing their own personal interests and for a social life.



Geospatial and Environmental Engineering Student Organization (GESO)

➔**GESO** is a professional association representing, among others, the Geomatic students. It advocates the interests of students in their relations with the Department and the Association of Students at ETH Zurich (➔**VSETH**). It provides assistance with various issues and problems and organises a wide variety of events.

Sport

The Zurich Academic Sports Association ➔**ASVZ** offers more than 130 kinds of sport. The modern triple sports hall, with its ancillary training, dance and sauna areas, is located on the Hönggerberg campus. In nearby woodland, jogging circuits are marked out, as well as a woodchip trail to promote open-air exercise.

Music

The joint ➔**Music Platform** of ETH and the University of Zurich offers all students who enjoy music the opportunity to network, perform and train – regardless of musical style or instrument. Supported by VSETH, music practice rooms are also available, almost all equipped with a piano and one with percussion.



Working and living on campus

On the Hönggerberg campus, computer rooms and groupwork rooms are available for students to work in – for instance on projects or the Master's thesis – or as a place to prepare for exams. These are places for exchange, for providing or receiving support, and for discussing academic or other problems. The documents and materials required for studies are available from the departments or from stationery supplies, books from the cross-disciplinary bookshop, the ETH Store or from the ➔**ETH library**.

Many ➔**catering facilities** such as the canteen (called Mensa), the Bistro, a Café and a street food market selling a variety of fare provide ready meals for every taste. There is a small supermarket for immediate everyday supplies. Enjoy a drink after work at the Alumni Lounge or at the LochNess, a bar run by students for students.

A select cultural mix of film and games evenings, open-air cinema and small concerts further enriches university life. There are also special events to enjoy, such as winter and summer evening parties or department excursions. ■



Studying in Zurich

Switzerland is known for its political and economic stability, safety, and extraordinary beauty. Swiss cities have a deep and rich history, combining tradition with the highest standards of modern living.

→ **Zurich**, one of the world's leading financial hubs, is Switzerland's largest city, its economic and cultural centre, and a city with an outstanding quality of living. Zurich's core is a beautiful old town, separated into two parts by the river Limmat, with excellent restaurants, quaint cafés, world-class museums and galleries, and a long promenade by the lake that stretches more than 30 km into the mountains. But Zurich is also international, ethnically diverse, ultramodern in architecture and lifestyle, and has a vibrant night life.

Public Transportation

Train, tram and bus will take you to almost every corner of Zurich and of the surrounding districts. Switzerland is a small country

with different language zones and an exceptional public transport network. Both the French-speaking Western Switzerland and the Italian-speaking South can be reached in a two to three-hour train ride. Other Swiss cities such as Bern, Basel or Lucerne are only an hour away, and many of the most famous sights in the mountains, for example the Jungfrauoch, Rigi, Matterhorn, or the Great Aletsch Glacier can be visited in a day trip. Paris or Milan are just a four-hour train ride away.

These are a few reasons why some call Zurich "the smallest metropolis in the world." You will likely discover many more once you are here. ■





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