Master of Science ETH in
Spatial Development and Infrastructure Systems
Our living space is a valuable commodity that requires careful – sustainable – handling, since it must satisfy not only our needs today, but also the needs of future generations. The fact is, though, that areas of settlement worldwide are expanding ever farther, and that the trend towards urbanisation continues unabated. At the same time, the significance of natural hazards is rising.

These global developments demand ever greater efforts in the design and construction of new infrastructure as well as the maintenance of existing systems. Just as important is the economical handling of natural and increasingly limited resources of soil, water, and air.

Being equal to these challenges requires well-grounded, specialist knowledge and the capability to apply effective methods and instruments. In short: in demand are specialists, who can assume the responsibilities of designing our living space for sustainable development, a task which relies heavily on the engineering sciences.

**Well-grounded education for attractive careers**

The Master’s Programme in Spatial Development and Infrastructure Systems was created precisely to meet these challenges: the programme provides a wide-ranging, university-level education and considerable practical orientation for prospective specialists who want to contribute to solutions of sustainable design and development.

The course of studies enables students of various technical backgrounds to acquire a common language and methodological acumen, in order to be capable of providing integrated solutions for sustainable living space and infrastructure system development.

Demanding and diverse careers beckon the successful graduates of this programme, for example in consulting agencies, transportation companies, providers of infrastructure, engineering and construction as well as real estate firms, banks and insurance companies, but also with municipalities, communities, cantons or the federal government. Similarly attractive are professional engagements in research and development, whether in higher education or in a research institute.

The Master’s Programme in Spatial Development and Infrastructure Systems is supported by the Department of Civil, Environmental and Geomatic Engineering of ETH Zurich (D-BAUG), which also offers Master’s Programmes in Civil Engineering, Environmental Engineering, and Geomatic Engineering.
Students decide the content of the master’s programme in consultation with their tutor. The tutors stand in contact with students throughout the entire course of studies, monitoring students’ progress and advising them. Admission to the master’s programme requires a bachelor’s degree comprising at least 180 ECTS credit points1 or a degree of equivalent status.

Students having a corresponding bachelor’s degree in civil engineering, environmental engineering, geomatic engineering and planning or architecture from ETH Zurich, EPF Lausanne or from an IDEA League Partner institution2 are admitted without additional requirements.

These conditions are also valid for graduates of Imperial College London (Bachelor of Civil Engineering), ParisTech (Bachelor of Architecture or Civil Engineering), TU Dresden (Bachelor of Transport Economics), TU Braunschweig (Bachelor of Mobility and Transportation), TU Dortmund (Bachelor of Spatial Planning) and the TU Wien (Bachelor of Regional Planning and Development). In all other cases, admission is granted only in compliance with individual requirements. Information regarding language requirements can be found under www.re-is.ethz.ch →. Courses and performance assessments are conducted – spoken or written – in German or English.

Two years «flat out»

The Spatial Development and Infrastructure Systems course of studies is a full-time programme leading to the academic title Master of Science ETH in Spatial Development and Infrastructure Systems (MSc ETH SD&IS). Achievement of the master’s degree requires 120 ECTS credit points. One ECTS credit point typically requires an average workload of 25–30 hours of study.

The master’s programme at ETH Zurich begins in the fall of a calendar year and generally takes four semesters. An academic year comprises two semesters of 14 weeks apiece.

The master’s degree must be completed within four years. Exceptions are made only in the event that additional credit points are required to satisfy admissions requirements due to insufficient technical background. Specifically this means: additional admissions requirements of 21–30 ECTS credit points justify an extension of the length of degree completion by one half year; additional requirements of 31–60 ECTS points justify an extension of one year.

1 European Credit Transfer System
2 TU Delft, RWTH Aachen, Chalmers

Using concrete examples to work out possibilities for future spatial development.

Railway operation laboratory (ROL) – Testing new operational concepts in miniature.

Explaining connections by using the model assessing road network safety deficits in the city of Zurich.
Content and structure of the course of studies

Students compile an individual curriculum with their tutor. The curriculum should accommodate students’ expectations and capabilities, as well as guaranteeing a thorough education for professional practice.

The master’s degree course of studies comprises compulsory courses, specialist courses and elective courses. In addition to coursework, students undertake an interdisciplinary group project. The master’s thesis completes the course of studies and leads to the degree.

Compulsory courses convey fundamental knowledge in traffic and transport systems, methods of environmental and landscape planning as well as basics in sustainable spatial development.

Specialist courses can be chosen from six areas: spatial planning and development, landscape and environmental planning, transport planning, transport systems, traffic engineering, and infrastructure management. Selection is possible across the full range of offerings and is made in consultation with the tutor.

Elective courses across a broad range of areas serve to complement specialized knowledge. Students have the entire course offerings of the ETH and University of Zurich available to them. Students are obliged to earn at least two credit points in courses offered within the Humanities, Social or Political Sciences.

The interdisciplinary project is a central part of the master’s degree course. The project is conducted in the form of group work and supervised in collaboration by the professorships of the participating courses of study. The project leadership alternates according to a specified rotation.

The master’s thesis takes 16 weeks and is carried out during the course of the entire final semester. The topic is decided in consultation with the tutor.

---

Master’s degree studies in Spatial Development and Infrastructure Systems

<table>
<thead>
<tr>
<th>1st – 3rd semester</th>
<th>ECTS credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsory courses</td>
<td>12</td>
</tr>
<tr>
<td>Specialist courses</td>
<td>60</td>
</tr>
<tr>
<td>Interdisciplinary project</td>
<td>12</td>
</tr>
<tr>
<td>Elective courses</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total 1st – 3rd semester</strong></td>
<td><strong>96</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4th semester</th>
<th>ECTS credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master’s thesis</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total 4th semester</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>

---

1 One ECTS credit point typically requires an average workload of 25–30 hours of study.

---

Simulating traffic flow using VISSIM software.
Studying at ETH Zurich...

What do students say about their course of studies at ETH Zurich? We asked for impressions and received responses from Jürgen Hengsberger, Diplomingenieur in Landscape Architecture and Planning from TU Munich, and from Corinne Aebischer, who completed a Bachelor’s in Architecture at ETH Zurich. Both are now in the second semester of the Master’s Programme in Spatial Development and Infrastructure Systems.

...and living in Zurich

Studying at ETH Zurich is demanding and requires considerable time investment. Nevertheless, students also find time for other satisfying pursuits. There are more than enough possibilities – even “in house”: the Geomatics and Environmental Engineering Association GUV www.guv.ethz.ch →, for example, is not only active in higher education policy, but also organises meet-and-greet gatherings, excursions and skiing weekends. The Student Union or VSETH www.vseth.ethz.ch → is more widely established, and represents the interests of students opposite the institutional administration, the media and the broader public – already for 150 years. The professionally managed union publishes its own news periodical, operates a cinema, organises parties and makes function and music rooms available to its membership of roughly 10,000.

The Academic Sports Association Zurich www.asvz.ethz.ch → is the right address for those who want to stay fit, learn a sport or seek friendly competition. The ASVZ serves both institutions of higher education in Zurich, offering more than 80 sports, and is one of the largest sports associations in Europe. Most courses are free of charge for registered students.

Zurich ranks high internationally among cities for its quality of life and has done so for years. Small wonder: the city on the Limmat sparkles with diversity in leisure and cultural offerings. The Lake of Zurich location and proximity to the mountains make the city a popular point of departure for water sports as well as alpine leisure activities. These offerings and popularity make Zurich a comparatively expensive city, though; students must reckon with monthly living expenses of at least CHF 1,850 on average. Personal monthly expenditures might average an additional CHF 200. Thus an annual budget of approximately CHF 24,600 is required.

Students can receive assistance in finding housing and accommodation through the Housing Office of the University/ETH Zurich www.wohnen.ethz.ch → or through Woko www.woko.ch →, which also mediates contacts for shared apartments.

For Corinne Aebischer, the Master’s Programme is “a stroke of luck,” as she describes. “It’s the perfect complement to my Bachelor’s in Architecture, and it deepens the knowledge that I gained in an internship.” About the course of studies, Corinne Aebischer appreciates most the way interdisciplinary thinking and collaboration on concrete projects are integrated. “That helps me to grasp the current challenges facing my home city of Zurich better; hopefully, some day in the future I’ll be able to help design appropriate solutions.”

“The Master’s Programme,” Jürgen Hengsberger says, “is highly interdisciplinary, and shows how varied an ETH course of studies can be. Students are free to explore a range of specialist fields without losing focus on the core themes. The numerous practice-related projects also ensure that students with a Master’s degree in Spatial Development and Infrastructure Systems from ETH are well equipped for the working world.”
The Project Manager

Sigrist began his professional education with a course of studies in geosciences at the University of Basel. His next stop following a bachelor’s degree was the master’s programme in Spatial Development and Infrastructure Systems at ETH Zurich, where he was confronted with a diversity of issues in a broad range of specialized areas. “Such challenges really stimulate me,” Sigrist says, “and I greatly appreciate that they are found not only in the master’s programme, but also in day-to-day practice.”

At R+R Burger and Partner, Christoph Sigrist is engaged primarily in project management on the awarding authority side of major traffic infrastructure projects – “so to speak in the planning of planning,” as he explains. The project palette is large: It extends from the new Gubrist Tunnel to the outfitting of the Danish national railway with modern signalling technology to the newest tram line in Bern. As the most critical professional prerequisite, Sigrist cites his broad interest in a wide range of specialist areas. “This includes environmental issues, problems of traffic technology, questions of spatial development, archaeological salvaging excavations, issues of finance and a whole lot more – all these things have to receive appropriate and timely consideration in our projects.”

What graduates say

A course of studies can appear ever so comprehensive and exciting on paper – what counts in the end is its suitability for practice. Here the master’s degree course of studies in Spatial Development and Infrastructure Systems consistently receives high marks – also from its own graduates.

“Daily professional practice brings me a diversity of specialized challenges such as I have seen during my master’s degree studies.”

Christoph Sigrist
“The active exchange with engineers, architects and community representatives is stimulating and exciting; it enriches my work tremendously.” “At ETH Zurich I learned to think analytically. That helps me now to grasp complex relationships quickly, and to derive from this the necessary process steps.”

Astrid Koller, MSc ETH Spatial Development and Infrastructure Systems, has been employed for about a year in a spatial planning agency comprising 30 colleagues. Her areas of engagement are highly diverse: she works on city planning, special-use plans, superstructure and building site preparation studies. Included among the more exciting tasks is holding architectural competitions.

On reflection, what actually motivated the Spatial Planner to pursue this career? “Above all it was the many city trips and excursions that I took,” Astrid Koller says, “which roused my interest in urban development and landscape architecture.”

Her studies at ETH Zurich then also fulfilled her high expectations. “The wide selection of subjects and the individually-designed curriculum made it possible that my education was made to measure. The practical exercises provided good preparation for the challenges of a professional working environment.” The small size of classes also appealed to Astrid Koller. “It meant that closer contacts could develop, while in lectures there was plenty of space for individualized topics.”