The world is changing. As a result of urbanisation, the majority of the world’s rapidly growing population lives in or near a city. While the need for energy, water and other natural resources is rising, the process of climate change actually demands we reduce the use of the latter. In the light of these developments, the main challenge currently facing humanity is to create a sustainable living environment. This can be achieved by means of a circular economy, in which we work in an energy efficient (or neutral) way and recycle and reuse as many resources as possible.

This can include reclaiming phosphates from wastewater or using bacteria to tackle soil pollution, for example. But the living environment must also be of high quality. One example of a challenge in this field is reducing fine particle emissions. In order to be able to make the transition from a linear to a circular economy, knowledge of the underlying production and consumption processes is required before we can take action. Hence the need for Environmental Engineers.

### Track

**Environmental Engineering**

<table>
<thead>
<tr>
<th>Diploma</th>
<th>Master of Science Civil Engineering - Applied Earth Sciences</th>
<th>Track: Environmental Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits</td>
<td>120 ECTS, 24 months</td>
<td></td>
</tr>
<tr>
<td>Starts in</td>
<td>September</td>
<td></td>
</tr>
<tr>
<td>Language of instruction</td>
<td>English</td>
<td></td>
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</tbody>
</table>
Programme
The Environmental Engineering track focuses on multidisciplinary technical competences in the design of and research into environmental-technical processes, understanding the interaction between man and the natural environment and closed-loop recycling (water and resources). The processes are studied in a fundamental way, from different angles, leading to a demand for new process technologies, measurement techniques and models. The aim is to teach students who will subsequently produce ground-breaking solutions for a high quality of life with clean water and a healthy environment. Specialisations include biotechnology, chemical conversions, remote sensing, earth sciences, water flows and treatment technology.

If science and society are to fully benefit from the convergence of these subject areas, it is essential for researchers and engineers to have a fundamental understanding of the various scientific areas mentioned and to have insight into the relationship between these areas.

Programme specialisations
During the track’s first semester, the fundamental aspects of both environmental technology and environmental science will be addressed and physical transport phenomena will be studied, among other subjects. We will also look at the fundamentals of Environmental Engineering and how environmental processes are monitored and managed. During the second semester, you will specialise, choosing either the technology variant or the science variant.

In the technology variant, the local influence and restoration of (disrupted) water and soil processes are studied using technological interventions (small recycling loop). The subjects addressed include treatment processes, water and health parameters and design techniques as well as the urban water and nutrient cycle.

In the science variant, the role of soil and the atmosphere in the hydrological cycle is studied (big recycling loop). This specialisation studies the global water cycle, urban meteorology and run-off.

Curriculum

<table>
<thead>
<tr>
<th>First Year (60 EC)</th>
<th>1st quarter</th>
<th>2nd quarter</th>
<th>3rd quarter</th>
<th>4th quarter</th>
<th>4th quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport processes in Environmental Engineering (4 EC)</td>
<td>Environmental Technology</td>
<td>Environmental Science</td>
<td>Environmental Technology</td>
<td>Environmental Science</td>
<td></td>
</tr>
<tr>
<td>Climate changes Science &amp; Ethics (4 EC)</td>
<td>Chemical process technology in water technology (5 EC)</td>
<td>Electives for Environmental Science (5 EC)</td>
<td>Materials separation in waste processing (5 EC)</td>
<td>Remote Sensing for Environmental Monitoring (5 EC)</td>
<td></td>
</tr>
<tr>
<td>Hydrological Measurements (4 EC)</td>
<td>Electives (4 EC or 6 EC)</td>
<td>Water &amp; Health (4 EC)</td>
<td>Introduction into meteorology (5 EC)</td>
<td>Modelling Coupled processes for engineering applications (5 EC)</td>
<td></td>
</tr>
<tr>
<td>Integrated Project: Leapfrog Environmental Degradation (4 EC)</td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year (60 EC)</th>
<th>1st quarter</th>
<th>2nd quarter</th>
<th>3rd quarter</th>
<th>4th quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Technology</td>
<td>Environmental Science</td>
<td>Electives for Environmental Technology (10 EC)</td>
<td>Electives for Environmental Science (10 EC)</td>
<td>Final Thesis (40 EC)</td>
</tr>
<tr>
<td>Water treatment research (5 EC)</td>
<td>Urban Climate &amp; Hydrology (5 EC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conceptual process design (5 EC)</td>
<td>From field observations to Modeling (5 EC)</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

1 EC = 28 hours of study, according to the European Credit Transfer System (ECTS). Total number of credits in the MSc programme = 120 EC.

For more information on all courses, please visit: www.studyguide.tudelft.nl
Possible graduation project topics
- Design your own satellites to monitor the world’s reservoirs
- Ceramic household drinking water filters amended with Nano zero valent iron
- From pollutant to biofuel
- Formation of bioplastics from Nereda® sludge
- Repeat water usage in the urban water cycle

Career prospects
The Netherlands is internationally renowned for its expertise and knowledge relating to water and the environment. A considerable number of TU Delft graduates in this field ultimately find jobs abroad. Last year, over a thousand vacancies for the job title ‘environmental engineer’ were posted on a renowned American job site. Waste water or drinking water engineers are often required. If we look more widely at which vacancies require experience in the field of environmental engineering, we find 32,807 vacancies. Positions range from ‘quality analyst’ to ‘consultant’ and ‘monitoring technician’. These figures will probably rise over the coming years, as the need for innovative solutions and techniques to improve the quality of life becomes more urgent.

“The unique feature of the Environmental Engineering track is that it brings together all this knowledge. It is a technical (engineering) programme in which, besides obtaining a sound scientific basis, the graduate will also acquire a wide range of engineering skills. The track covers a broad field: water from the urban and global water cycle, soil processes and climate. Special attention will be devoted to underlying processes, mathematical descriptions, model-based substantiation and the measurement (including remote sensing) of the environmental processes and cycles. In addition, a great deal of attention will be paid to designing technical solutions for disruptions in the (water) cycle due to human actions. This distinguishes programmes at TU Delft from those at other universities. Furthermore, this programme mobilises internationally renowned researchers in the field of Environmental Engineering from various faculties at TU Delft who can inspire the students and motivate them to perform high-level research and translate the latter into working practice, leading to innovations in the field of environmental technology and science.”
Dutch BSc degree
If you hold a Dutch BSc degree closely related to the Master’s programme, you can be admitted directly. However, if your undergraduate programme is not closely related to the Master’s programme you will be required to take additional courses in what is called a bridging programme. This may be a standard programme or it may be tailored to your specific situation.

To see which Master’s programmes are open to you on completion of your Bachelor’s degree at a Dutch university, go to www.doorstroommatrix.nl.

Applications through Studielink: www.tudelft.studielink.nl.

Dutch HBO degree
An HBO Bachelor’s degree does not qualify you for direct admission to a TU Delft Master’s programme. You will first need to complete a supplementary programme in order to bring your knowledge up to the required level. You can do this during your HBO programme by completing a bridging minor or by means of a bridging programme after completing your HBO diploma.

Entrance requirements for mathematics and English (some exceptions) apply for both the bridging minor and the bridging programme.

See www.hbodoorstroom.tudelft.nl for detailed information. Applications through Studielink: www.tudelft.studielink.nl.

International applicants
To be considered for admission to an MSc programme you will need to meet TU Delft’s general admission requirements.

1. A University Bachelor’s degree (or proof that you have nearly completed a Bachelor’s programme) in a main subject closely related to the MSc programme to which you are applying, with good grades for the key courses.
2. A BSc Cumulative Grade Point Average (CGPA) of at least 75% of the scale maximum.
   - A TOEFL (Test of English as a Foreign Language) with an overall Band score of at least 90 and a minimum score of 21 for each section. Please note that we only accept the TOEFL internet-based test.
   - or an IELTS (academic version) with an overall Band score of at least 6.5 and a minimum of 6.0 for each section.
   - or proof that you have passed the University of Cambridge ‘Certificate of Proficiency in English’ or the University of Cambridge ‘Certificate in Advanced English’ with a minimum grade B.

For international students, the application period starts on 1 October and closes on 1 April. To start an MSc application, please complete the online application and pay the refundable application fee of €100. You will then receive an email with the link to upload the required documents.

For more information about the application procedure and studying at TU Delft in general, go to www.admissions.tudelft.nl.

Introduction week
All international students will be welcomed with the award winning introduction programme. The introduction consists of a variety of workshops and projects during which you will get to know other international students, visit Delft’s highlights and learn the ins and outs of the TU Delft campus. After this very interesting and fun week, you will be introduced to the CEG faculty. You will receive helpful information about the Dutch education system and meet the fellow students from your programme during a variety of social and educational activities.

For further information
Please visit the webpage for all details, complete requirements, deadlines and contact information:
www.cive.msc.tudelft.nl

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