Faculty of Civil Engineering and Geosciences

Bachelor’s degree programme

Applied Earth Sciences

TU Delft
A challenging programme that covers the world

Are you looking for a wide-ranging academic degree programme that combines knowledge of geology with plenty of mathematics, physics and chemistry? A programme that is highly international in character? If so, the Bachelor's degree programme in Applied Earth Sciences is an excellent choice. You will qualify as an all-round earth scientist, who not only has knowledge of the processes within and on our planet, but also knows how to apply that knowledge to tackle real issues in society. For example, you will learn how to optimise the extraction of crude oil and how to extract the earth’s minerals with a minimum possible impact on the environment. You will learn how to use satellites to monitor the levels of dykes, subsidence caused by the extraction of gas or salt or the melting of the ice caps. In order to learn all of these skills effectively, you will not spend all of your time in the lecture room. You will take laboratory courses, go on a number of excursions and do fieldwork. You will also attend regular tutorials.

What does the study programme look like?
Applied Earth Sciences is the only Bachelor’s degree programme in the Netherlands that combines geology and technology. There is a relatively small number of students in the study programme. Therefore, the contact between students and lecturers is informal. As an Applied Earth Sciences student, you will be qualified as a critical, independent and entrepreneurial engineer with an ability to look into the future. Once you have graduated, you may find employment anywhere in the world. The degree programme is taught entirely in English.

During your programme, you will become acquainted with the following six specialist fields:

• Resource Engineering
  Extracting solid minerals and metals from the earth and developing knowledge and techniques across the mining value chain from exploration to market

• Petroleum Engineering
  Extracting liquid minerals, such as oil and gas, and developing knowledge and
techniques to increase the productivity of oil and gas fields
• Geo-Engineering
Assessing the suitability of the subsoil for foundations, tunnels, dykes and other infrastructure and developing (environmentally-friendly) techniques for improving the soil and subsoil
• Applied Geophysics and Petrophysics
Imaging geological structures, oil and gas reservoirs, and near-surface soils and rocks of engineering and environmental relevance using seismic, electrical or electromagnetic technologies and using drilling and other techniques to determine the physical properties of rocks
• Reservoir Geology
Applying knowledge of geology in determining where oil and gas fields are likely to occur and developing plans for the smart extraction of existing reserves
• Geoscience and Remote Sensing
Using satellites and aircraft to track processes in and on the earth and in the atmosphere

First year
You will be offered a good foundation in mathematics, physics and chemistry. You will also learn a lot of geology and become acquainted with the six specialist fields.

Second year
You will continue to develop your technical and geological knowledge and increasingly learn how to apply this knowledge. Towards the end of the academic year, one main focus will be participating in an extensive fieldwork in the South of France.

‘You won’t spend all your time in the lecture room: you will also take laboratory courses, do fieldwork and go on excursions’

<table>
<thead>
<tr>
<th>Number of first-year students (2015)</th>
<th>106</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>English</td>
</tr>
<tr>
<td>Average first-year study load (hrs/week)</td>
<td>40</td>
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<tr>
<td>• Lectures</td>
<td>12</td>
</tr>
<tr>
<td>• Projects and laboratory courses</td>
<td>9</td>
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<tr>
<td>• Self-study</td>
<td>19</td>
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Third year
You will take a minor in the first half of the year. The minor enables you to broaden your perspective by taking courses outside your specialist field or to actually specialise even further in your field. After the minor, you will spend the second half of the academic year preparing for your Master’s degree programme in Applied Earth Sciences. A key part of this will involve working on your final Bachelor assignment.

Practical
Each academic year is divided into four teaching periods of ten weeks. The basic modules in each period will be geology, mathematics, physics and chemistry. In addition, each period will be devoted to a particular theme that will feature both lectures and laboratory courses. You will also cover the six Applied Earth Sciences specialist fields in each period. As your programme progresses, the emphasis will increasingly shift from general substantive knowledge to the application of this knowledge. You will also have a series of interim assessments during each period. Each period will be followed by a two-week examination period. You will complete your Bachelor’s degree programme with your final Bachelor assignment, which must be on a topic related to one of the five tracks of the Master’s degree programme in Applied Earth Sciences. When you have finished this, you will be awarded your Bachelor of Science (BSc) degree.

Curriculum (indicative)

For more information about all modules: www.studyguide.nl
What are the prospects after my bachelor’s degree programme?
When you have obtained your Bachelor’s degree, you can start the two-year English-language Master’s programme in Applied Earth Sciences. There are six tracks to choose from, broadly corresponding to the six specialist fields with which you have become acquainted during the Bachelor’s programme:

- Petroleum Engineering & Geosciences, a combination of the specialist fields Petroleum Engineering and Reservoir Geology
- Resource Engineering
- Geo-Engineering
- Applied Geophysics
- Geoscience and Remote Sensing
- Environmental Engineering

Several specialisations are possible within each track. Depending on your combination of modules, your Bachelor’s degree also enables you to take a different Master’s degree programme at TU Delft or at another Dutch or foreign university.

What characterises a student of Applied Earth Sciences?
“Of course, not all students are the same, but there are certain characteristics that typify students of Applied Earth Sciences. They are adventurous, inquisitive, dynamic, sociable, active and extremely resilient. In addition, they are able to work independently, are full of initiative and eager to explore the world. If you want to study Applied Earth Sciences, having your fair share of these characteristics will certainly help. Take the fieldwork period, for example. You will not receive continuous guidance, but will need to ensure that you collect the right data in a large area. You will not be staying in a luxury hotel, but in a tent.”
Timo Heimovaara, Director of Studies, Applied Earth Sciences

Career prospects
Your career profile
Graduates in Applied Earth Sciences have great potential in the labour market. This is hardly surprising: armed with your degree, you will have a multidisciplinary qualification, advanced analytical skills and a great deal
of specialist knowledge. You will be able to think critically and solve complex problems. During your study programme, you will have numerous opportunities to get into contact with businesses and organisations. If you take advantage of these opportunities, you will be part of an international network of professionals by the end of your programme. Employers within this network understand the quality of Applied Earth Sciences graduates and will be eager to employ you. You will therefore have excellent opportunities for a global career.

Where will you find a job?
You will encounter graduates in Applied Earth Sciences everywhere. For example, they work in the Norwegian oil industry, extract rock salt in the Netherlands, work as consultants on the construction of dykes using dredging spoil in Jakarta, are involved in innovative iron-ore extraction in Australia or conduct research for the Royal Dutch Meteorological Institute (KNMI) or a university. Important employers include Shell, ExxonMobil, Rio Tinto, Tata Steel, Fugro, Schlumberger, ESA, research institutions and dredging companies.

What are potential jobs?
Not only do you find Applied Earth Scientists all over the world, they also get the opportunity of a wide variety of jobs. New graduates, for example, often work as project engineers for oil companies. This position involves devising, calculating and researching the technical potential of a project. They may also become production engineers at mining companies and ensure the efficient and safe extraction of raw materials. You will also encounter our graduates working as managers, conducting research at knowledge institutions or working as earth-observation experts for consultancies.

‘It was a great choice!’

This study appealed to me when all I knew was that I wanted to go to TU Delft to take a science-related beta study programme! The problem was that I like everything. So when I found Applied Earth Sciences with its diversity, I thought that would be a good choice. After travelling abroad during my gap year, I knew I wanted more opportunities to travel. Applied Earth Sciences provides more than enough of those during the programme and afterwards! Now, after studying Applied Earth Sciences for a year and never being bored, I know one more thing; it was a great choice!’

Christine Klöpping
3rd year student
Come and see for yourself
If you would like to know more about this Bachelor’s degree programme, why not come along to Delft? For example, you can attend one of the following activities:

Open Days – during these days, all of the degree programmes showcase what they have to offer. www.opendagen.tudelft.nl

Student for a day – experience what it is like to study in Delft. www.meelopdagen.tudelft.nl

Last Question Day – are you in grade 6 of pre-university education (vwo)? Ask your final questions at the Last Question Day. www.tudelft.nl/lqd

Online
You can also get acquainted with and immerse yourself in the study programme online:

School students’ LAB (ScholierenLAB) – for help with your coursework project (profielwerkstuk), trial studying online and extra challenging programmes that give you a taster of studying at TU Delft. www.scholierenlab.tudelft.nl

Admission requirements
With a vwo diploma with a Nature & Technology (NT) profile, you will be directly admitted to this programme. If you have a Nature & Health (NG) profile, your examination subjects must include mathematics B. Mathematics D is also recommended, but not compulsory. With an Economics & Society (EM) or Culture & Society (CM) profile, mathematics B, physics and chemistry at vwo level are compulsory.

If you have different previous qualifications (e.g. anon-Dutch diploma), take a look at: www.aes.bsc.tudelft.nl

Binding recommendation on continuation of studies (BSA)
If you have obtained fewer than 45 ECTS credits (of the total of 60 available) by the end of the first year of study, you will be issued with what is known as a negative binding recommendation on continuation of studies. This means that you will not be able to enrol for this study programme at TU Delft for the following four years. www.bsa.tudelft.nl

Matching
If you enrol before 1 May, you can participate in our matching activity. This activity will help you to get a deeper understanding of the programme to assess if it is a good match for you and to better prepare you for the start of your studies.

Delft Honours Programme
The Delft Honours Programme is for students who would like an additional challenge and are capable of achieving more than the standard teaching programme. This is in addition to the regular study programme. It gives you the opportunity to acquire additional knowledge in or outside your field of specialisation, to work on your personal development and to collaborate with students on other programmes. www.honours.tudelft.nl

Digital brochures
View this one and other brochures online at: www.brochures.tudelft.nl

Virtual campus
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