In a world very much dominated by technology, applied mathematics is absolutely essential. It plays an important part in engineering, construction, finance, budgeting, planning, policymaking and countless other activities.

Just imagine what would happen if someone were to devise a model that could make accurate predictions for fluctuations in the stock market. There can be little doubt that such a model - a typical example of applied mathematics - would become an important tool for investors all around the world.

Computational and mathematical tools are used to predict the behaviours of technical, physical and even social systems, ranging from tomorrow’s weather to the viability of social insurance systems and the global climate one hundred years from now. Applied mathematicians devise models and algorithms that influence our daily lives. For example, everybody uses search engines to find information on the internet. Thanks to advanced mathematical algorithms, these search engines give us this information in a fraction of a second.

### Diploma
Master of Science
Applied Mathematics

### Credits
120 ECTS, 24 months

### Starts in
September

### Language of instruction
English

### % International students
20%

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**Programme**
The TU Delft Master of Science programme in Applied Mathematics is designed for students with a Bachelor's degree in Applied Mathematics or a closely related subject. When you join the MSc Programme in Applied Mathematics at TU Delft you will gain a thorough knowledge of applicable mathematics, in addition to developing expertise in applying the methods and tools of mathematics to problems in science and engineering.

This programme focuses on the acquisition of broad experience in simulation and the mathematical modelling of problems in science and engineering, in the mathematical analysis of these models and in the implementation of the results. You will gain sufficient insight into the underlying mathematical theories, allowing you to develop new mathematical methods and techniques, if needed.
First Year

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<tr>
<th>1st semester</th>
<th>2nd semester</th>
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<tr>
<td>Specialisation course of free elective</td>
<td>Specialisation courses and free electives</td>
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<tr>
<td>Mathematical modelling and society (SEC) and Ethics for AM (SEC)</td>
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<tr>
<td>Choose 3 out of 5 common core courses: Scientific Computing, Applied Functional Analysis, Discrete Optimisation, Martingales Brownian Motion and Stochastic Processes, Statistical Inference</td>
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Second Year

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<th>1st semester</th>
<th>2nd semester</th>
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<tr>
<td>Specialisation courses and free electives</td>
<td>Graduation Project (42 EC)</td>
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<tr>
<td>Start Graduation project</td>
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For more information on all courses, please visit: [www.studyguide.tudelft.nl](http://www.studyguide.tudelft.nl)

Programme specialisations

You can specialise in the following subjects:

**Probability and Statistics** focuses on the modelling and mathematical analysis of scientific and engineering problems that are characterised by uncertainty. It includes courses in applied probability, risk analysis and statistics.

**Computational Science and Engineering** focuses on mathematical modelling and the simulation of problems that arise in science and engineering, the mathematical analysis of such models and the development of new mathematical methods and techniques for analysing such problems. It includes courses in mathematical physics, numerical analysis and mathematical system theory.

**Financial Engineering** focuses on the development and application of quantitative methods in finance and economics. The specialisations offer a solid background in financial mathematics, probability and numerical methods.

**Analysis** provides the mathematical tools required for the rigorous analysis of mathematical models. Such models are typically formulated as a partial differential equation. Apart from very special cases, a closed-form solution cannot be given, and deeper tools are required to study the properties of the solutions. If you choose this specialisation you will learn methods that come from approximation theory, Fourier analysis, functional analysis and stochastic analysis, to help you find these solutions.

**Optimisation** focuses on problems from a broad perspective. You learn to develop and analyse models, investigate computational complexity, and how to design, analyse, implement and test algorithms. The main focus is on deterministic optimisation. The specialisation Optimisation is a theory based study, but you will also look into real-life applications in the field of health, logistics energy etc.

I completed my Bachelor’s degree in Mathematics at Leiden University. As part of my Bachelor’s, I took some applied courses at Delft University of Technology, which I found more interesting than the theoretical courses. I therefore decided that I wanted to do a Master’s in Applied Mathematics at TU Delft.

What I really like about the courses in this Master’s programme is that they all include some sort of project work. These projects involve various disciplines such as Physics, Civil Engineering and Computer Science. At TU Delft, it is common to do exercises and projects in groups with other students so that you can learn from each other, which also makes the work easier.

Another important aspect is that you have a lot of freedom in choosing your courses, which allows you to try different things and find out what you are most interested in. The members of the academic staff are really approachable and helpful. If you have a question about homework or courses that you might want to take, you can just go to the professor’s office and ask him or her for help.

Delft itself is a really great student city. It has lots of nice little coffee places, but also a very busy city centre with a lot of restaurants and bars, so after a hard day’s study you have plenty of opportunities to relax and enjoy yourself.
Examples of graduation projects:

- The Riesz transform on a complete Riemannian manifold with Ricci curvature bounded from below (Analysis, internal)
- Investigation of Different Solvers for Radiotherapy Treatment Planning Problems (CSE, with Erasmus Medical Center)
- Numerical Pricing of Bermudan Options with Shannon Wavelet Expansions (Financial Engineering, with CRM Barcelona)
- Computational approaches for the MINLP waste water network model (Optimisation, with ORTEC)
- The evidential value of gunshot residue composition comparisons. (Probability and Statistics, with NFI)

Career prospects

There is a close connection between Delft University of Technology and industry. During your study you will get the opportunity to get in contact with companies and build a network. Besides internships and thesis projects at companies you can also get in contact with companies via the EEMCS recruitment days or the technical career fair of TU Delft.

Mathematical experts are highly desired for their ability to predict and optimise properties of technical or physical systems that have yet to be realised, using computational and mathematical tools. Applied mathematicians are in particular demand as consultants, scientific software developers, project managers or researchers in large industries and research institutes, including Delft Hydraulics (WL), National Aerospace Laboratory (NLR), TNO and the Royal Netherlands Meteorological Institute (KNMI). In addition, many opportunities exist in the research departments of large industrial companies (e.g. Philips, Shell, AKZO-Nobel and KPN). Advances in mathematical finance have created a demand for applied mathematicians in such financial institutions as ABN Amro, as well as in governmental organisations like Rijkswaterstaat and CBS. Furthermore, excellent students can choose to pursue a PhD degree at a university.

I am a professor of statistics at the Delft Institute of Applied Mathematics. My research focuses on mathematical modelling and the analysis of incomplete and corrupted data. Such data occur in many applications. The aspect of applied mathematics that attracts me the most is its breadth, as it involves real-life applications and (in my opinion) beautiful mathematics. Collaboration with experts in a variety of disciplines is also inspiring. One of my graduate students recently entered the field of forensic science. At the Netherlands Forensic Institute, I developed a model for quantifying the strength of proof when a partial DNA profile is found at a crime scene. Students of applied mathematics acquire thorough knowledge of mathematics and learn to apply it to real-life problems. Our students are often complimented by their employers for their problem-solving attitudes, mathematical creativity and programming skills.
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 on the key courses.
2. A BSc Cumulative Grade Point Average (CGPA) of at least 75% of the scale maximum
3. Proof of English language proficiency:
   An 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.
   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’ with a minimum grade B or the University of Cambridge ‘Certificate in Advanced English’

For international students, the application period starts October 1 and closes at April 1. To start an MSc application, please complete the online application and pay the refundable application fee of €100. Next, you will 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 the highlights of Delft and learn the ins and outs of the TU Delft campus.

After this very interesting and fun week, you will be introduced to the EEMCS faculty. During the Master Kick Off, you will receive helpful information about the Dutch education system and meet the fellow students from your programme in a variety of social and educational activities.