

Faculty of Aerospace Engineering



Bachelor's degree programme

# Aerospace Engineering

Delft University of Technology  
Faculty of Aerospace Engineering  
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www.ae.tudelft.nl

 **TU Delft**

September 2015

 **TU Delft**

# Flight to excellence

**How do you ensure that a satellite is launched into the right orbit around the earth or how do you design a micro-aircraft that can save people's lives? While studying Aerospace Engineering you will learn all of this and much more. In order to design, build and operate aircraft or satellites, you need to have knowledge of a range of different disciplines and know how to combine them.**

You come into contact with technologies and materials from the aerospace industry every day. GPS tracking and weather forecasting are both made possible by the presence of satellites in space. The mirrors on a lorry or car have been designed in such a way as to generate as little resistance as possible. And just try to imagine how much food is transported by air every single day. More than 2,500 Bachelor's and Master's students study at the faculty of Aerospace Engineering, a third of them are international students. The faculty is unique in Europe and enjoys worldwide acclaim. We have state-of-the-art facilities at our disposal, including an advanced flight simulator, our own aircraft as a flying classroom, a cleanroom to develop our own satellites, subsonic, supersonic and hypersonic wind tunnels and a large laboratory for the development, manufacturing and testing of materials and structures.

## **What does the study programme involve?**

From the very first day of studying at our faculty, you will be involved in aerospace engineering. The aircraft, rocket and satel-

lite are used as study objects to teach you basic technical knowledge. As the programme progresses, the emphasis shifts gradually from theory to application. Each academic year is divided into four ten week periods. This means that you will have examinations four times a year. Lectures alternate with seminars, laboratory courses and projects where you put the knowledge you have acquired into practice. During project education, the focus is on learning to design as a team. Together with your team, you will work hard to solve a problem and achieve the optimum design.

## **First year**

### **Introduction to the field**

In the first year, you will be taught the basic techniques of design. You will also spend a relatively large amount of your time on mathematics and physics modules. You will be taught the necessary theory by means of various modes of instruction under the supervision of lecturers and senior students. From the first year onwards, the programme is taught exclusively in English.



Intake of first-year students (2016)	480
Language	English
Average first-year study load (hrs p/w)	42
Lectures	16
Projects and laboratory courses	8
Self-study	18

## **Second year**

### **Exploring the field in greater depth**

In the second and third year, the focus of education increasingly shifts from basic theory to courses in aerospace engineering. The basic knowledge acquired in the first year will be further enhanced and applied. In the second year, the lectures will be supplemented to a greater extent by project education and laboratory courses. You will learn to design systems and to process measurement data.

**'The emphasis shifts gradually from theory to application'**

## **Third year**

### **Free curriculum and graduation**

From the first semester of the third year, the study programme is no longer identical for every student. You will choose a minor subject at TU Delft or elsewhere. During this period, you can also go on an exchange to a university abroad.

The second semester focuses on the final stage in the design process: verification and validation. For this you will join five other students in the Cessna Citation II, a.k.a. the faculty's flying classroom, which you will use to carry out measurements in the air. Everyone completes their third year with the Design Synthesis Exercise (DSE). During a ten-week period, you will work with a team of students on an original and current design assignment, in many cases commissioned by industries, institutes or scientists. This assignment can vary from the design of an aircraft to the planning of a Mars mission. You will complete your DSE with a presentation to a panel of judges.

## Curriculum for academic year 2015-2016

### 1st year

Theme: Exploration (1 <sup>st</sup> semester)	Theme: Design and Construction (2 <sup>nd</sup> semester)
Exploring Aerospace Engineering	Design and Construction
Engineering Drawing	Aerospace Design and Systems Engineering Elements I
Study Skills and Guidance	Technical Writing in English
Introduction to Aerospace Engineering I	Aerospace Mechanics of Materials
Introduction to Aerospace Engineering II	
	Physics I
Aerospace Materials	Physics II
Statics	Calculus II
Dynamics	Linear Algebra
Calculus I-I	Programming and Scientific Computing in Python for Aerospace
Calculus I-II	

### 2nd year

Theme: System Design (1 <sup>st</sup> semester)	Theme: Test Analysis and Simulation (2 <sup>nd</sup> semester)
System Design	Test, Analysis and Simulation
Aerospace Design and Systems Engineering Elements II	Experimental Research and Data Analysis
Oral presentation	Scientific Reporting
Aerodynamics I	Aerospace Systems and Control Theory
Low-speed Windtunnel Test	Instrumentation and Signals
Aerodynamics II	
	Flight and Orbital Mechanics
Structural Analysis and Design	Propulsion and Power
Vibrations	
	Applied Numerical Analysis
Differential Equations	Computational Modelling
Probability and Statistics	

### 3rd year

Theme: Minor (1 <sup>st</sup> semester)	Theme: Verification and Validation (2 <sup>nd</sup> semester)
Minor Programme	Systems Engineering and Aerospace Design
	Production of Aerospace Systems
	Simulation, Verification and Validation
	Aerospace Flight Dynamics and Simulation, including Flight Test (CESSNA CITATION PH-lab)
	Project (10 weeks): Design Synthesis Exercise



#### Do you have what it takes to be an Aerospace Engineering student?

Do you enjoy testing your limits and achieving breakthroughs? Are you interested in mathematics and physics and do you expect to achieve an average final mark of at least 7 out of 10 for these subjects? Do you enjoy working with others? Do you have enough self-discipline to work and plan independently? In that case, Aerospace Engineering might be the programme for you.

#### What can you do after your Bachelor's degree programme?

##### Master's degree programmes

After completing the Bachelor, you can transfer to the two-year Master's programme in Aerospace Engineering or the EWEM (European Wind Energy Master), but you will also be welcome at countless other Master's degree programmes in the Netherlands and abroad. In the Master's programme, you will

explore an area of expertise in aerospace engineering in greater depth. You will also conduct independent graduation research in the same area. During the Master's degree programme in Aerospace Engineering you can choose to specialise in various different fields, from Aerodynamics to Space Flight.

**During a ten-week period you will work with a team of students on an original and topical design assignment'**

## Career prospects

### Your career profile

As many as 98% of MSc graduates find a suitable job within six months. Approximately 40% of these graduates actually find employment in companies within the aerospace engineering industries.

Examples of such technical companies include Airbus, NASA, KLM, Schiphol, Dutch Space or Boeing. The remaining 60% find work at technical companies in other sectors, such as Shell, Siemens, BMW, Philips, TNO and Ferrari. In addition, many graduates also work for consultancies, such as McKinsey & Company and the Boston Consulting Group, or banks like ING and Goldman Sachs. All of these companies are always on the look-out for people with advanced analytical skills and have had good experience with aerospace engineers.

**‘As many as 98% of MSc graduates find a suitable job within six months’**

## ‘Delft was the best choice for me’



Isa Ruchser  
2nd year student

‘During my first year at the Faculty of Aerospace Engineering, I learned a lot about space as well as aviation and both are becoming more fascinating every day. The great thing in Delft is that during different projects, such as designing a wing box or a spacecraft mission to mars, I already get to use the knowledge I gained in lectures and can actually apply it. This turns the plain theory of certain subjects into a lot more fun and connects all the different subjects. Since the programme is very broad,

it also allows joining one of the many dream teams of the university, such as the solarboat or the DUT racing car. Another nice aspect is the international atmosphere at the university, especially at the Faculty of Aerospace Engineering. You get to meet and know many different cultures and people. Students also have the possibility to do part of their study abroad, since the faculty has established a broad international network. An opportunity I will definitely not miss out on!’

## 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.lr.tudelft.nl/opendays](http://www.lr.tudelft.nl/opendays)

Last Question Day – are you in grade 6 of pre-university education (VWO)? If so, you can ask any final questions you may have during the Last Question Day.

[www.tudelft.nl/lqd](http://www.tudelft.nl/lqd)

## Numerus Clausus

There will be a cap on student intake for the Bachelor’s degree programme in Aerospace Engineering for the academic year 2016-2017. The available places are allocated by means of decentralised selection and a weighted lottery procedure. The application deadline is January 15. The selection procedure is currently being changed. Please check for the latest information:

[www.lr.tudelft.nl/en/study/admission-and-application/](http://www.lr.tudelft.nl/en/study/admission-and-application/)

## Admission requirements

You will be directly admitted to the selection procedure when you are in possession of a Dutch VWO diploma with a N&T profile. If you have a N&G profile, you must have Mathematics B and Physics in your curriculum. The subjects mathematics D and NLT are not obligatory, but are recommended.



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[instagram.com/TUDelft](https://instagram.com/TUDelft)

The admission requirements for students who don’t have a Dutch diploma can be found on our website:

[www.ae.tudelft.nl/admissionrequirements](http://www.ae.tudelft.nl/admissionrequirements)

## Binding recommendation on continuation of studies (BSA)

If you study at TU Delft, you will be subject to the binding recommendation on the continuation of studies (BSA). This means that you must obtain at least 45 of the 60 ECTS credits available in the first year. If you fail to do so, you must leave the programme and will not be able to enrol for Aerospace Engineering for the next four years.

[www.bsa.tudelft.nl](http://www.bsa.tudelft.nl)

## Delft Honours Programme

The Delft Honours Programme is intended for students in search of an additional challenge who 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 also to collaborate with students of other programmes.

[www.honours.tudelft.nl](http://www.honours.tudelft.nl)

## Digital brochures

View this and other brochures online

[www.brochures.tudelft.nl](http://www.brochures.tudelft.nl)

## Virtual campus

If you would like to explore our campus, take a look at:

[www.campus.tudelft.nl](http://www.campus.tudelft.nl)