Computer Science and Engineering

Using social media to localise disasters, making friendly care-robots and recognising objects in images. In the Computer Science and Engineering (CSE) degree programme at TU Delft, you will learn the theory and practice of developing software and processing data for the intelligent systems of today and the future.

What does the degree programme look like?
The programme consists of a mixture of lectures, practical assignments, group projects and considerable self-study. Each quarter in the first year consists of three courses: a fundamental course, a more applied course and a practical course, such as a project. You will learn how to analyse and design computer systems and their underlying algorithms. You will also study the subject of computability theory, addressing such questions as: what is computing, what can computers do and what can they not do, and how can you describe machines in a mathematical way? Artificial intelligence, computer graphics, data mining and image processing are also part of the programme. In addition, you will regularly collaborate with other students on projects.

What will you learn?
In the first year, you will take a compulsory combination of courses. This is divided into about 40% fundamental computer science, 30% mathematics and 30% computer science skills.
The courses include among others:

• Computer Organisation: You will learn how the individual components of a computer form a working machine. This course teaches you the low-level mechanisms involved in making hardware and software work together.

• Object-Oriented Programming: You will learn the basics of programming. At the end of this course, you will be able to develop various applications.

• Calculus: This course builds on Mathematics B, but the pace is much faster and the level much more in-depth. You will learn the mathematics that is necessary to understand Probability and Statistics.

In the second quarter, you will work together on a project, for example to develop an application to help illiterate people.

The second year consists of compulsory courses and electives. You may choose from three variant blocks, each comprising three courses. Within the variants, you e.g. learn how to automatically recognise license plate numbers, how to program embedded software and how to process and analyse large amounts of data in the cloud.

As part of the curriculum, you will work in a small team with fellow students on a large software project, developing software for an external stakeholder to tackle a socially relevant issue. Examples of such projects include programming a drone that can independently survey a commercial greenhouse or developing a scheduling application for a hospital.

You will start your third year with a minor, which is aimed at broadening your knowledge or preparing you for a Master’s programme. It is also possible to do the minor at a different university in the Netherlands or abroad.

The degree programme is rounded off with the Research Project. This project is carried out independently at TU Delft or at a company and involves research into a subject related to computer science. For example, this could involve implementing a new algorithm, and the necessary experimental tools to evaluate it against existing alternatives.

Are you interested? Join information events like open days, online trail studying or student for a day.

What can you do after completing this programme?

• Intelligently analyse and tackle complex problem environments
• Collaborate in teams and with end users
• Design and develop robust, high-quality software
• Quantify how good an algorithmic problem solution is

What potential jobs could you do?

• Software engineer
• Data scientist
• Security analyst
• Systems analyst
• Consultant
• Researcher
• Entrepreneur

What competencies does a student of Computer Science and Engineering need to have?

• Affinity with mathematics
• Highly motivated
• Perseverance
• Ability to think abstractly

Which Master’s programmes are possible after completing this Bachelor’s?

• Computer Science
  - Data Science and Technology
  - Software Technology
• EIT Digital - ICT Innovation
• Embedded Software

Where can you potentially find a job?

• Google
• Exact
• KPMG
• ASML
• ING
• Booking.com
• TNO
• Consultancy agency
• Own company

87% of the bachelor students will start a master’s programme

30% mathematics in the first year

900 CSE bachelor students in 2017

www.cse.bsc.tudelft.nl/