Innovations made possible by embedded systems are making our lives healthier, more interesting, safer and more sustainable.

These innovations are at the heart of industrial innovation and competitiveness, creating and sustaining jobs and economic well-being.

Embedded systems are hardware/software systems built into devices that are not necessarily 'recognised' as computerised devices, but these systems do control the functionality and perceived quality of these devices. Some specific examples of embedded systems include: controllers for systems within a car; the automatic pilot of an aircraft; the chip set and software for smartphones, tablets and smart TVs; wireless sensor networks for ambient intelligence, a pacemaker; and control systems embedded in robots/mechatronic machines. The growth rate in the embedded systems industry is more than 10% per annum and, according to forecasts, there will be more than 40 billion devices worldwide by 2020.

Programme
The TU Delft Master of Science Programme in Embedded Systems focuses on the design methodology of hardware and software user environments. It covers a wide spectrum of topics ranging from integrated circuit design, computer architecture, communication networks and real-time operating systems to software engineering and formal methods for embedded applications. As an essential component in the inexorable process of miniaturisation, it is an exciting engineering science of the future.

The Embedded Systems programme is a 3TU programme. The 3TU federation maximises innovation by combining and concentrating the strengths of the three leading universities of technology in the Netherlands – Delft University of Technology, Eindhoven University of Technology and the University of Twente - in research, education and knowledge transfer.
The link between computer science and electrical engineering has always intrigued me, so I was overjoyed to find out that TU Delft offered the MSc programme that is the perfect combination of the two: Embedded Systems. The feature that enticed me the most was the flexibility that TU Delft offers. Given the multi-disciplinary nature of the embedded systems domain, it often requires knowledge of control systems, computer engineering, applied physics or similar areas. The flexibility to take courses of your choice at any faculty is highly beneficial in this regard. In addition to the programme’s world-renowned reputation and industrial partners, the wide variety of electives – ranging from Embedded Real-Time Systems to Advanced Multicore Systems – is another reason for choosing TUD. Furthermore, because it is a 3TU programme, students are automatically registered in the partner institutions (the University of Twente and TU Eindhoven), where they can also take courses. The journey has been promising thus far. Courses are taught from a practical perspective. Students are motivated to think independently through challenging assignments, and they are assisted by excellent tutors.

Namitha Gopalakrishna (India)
Programme graduates may expect exciting careers, since there is an acute need for competent embedded systems experts due to the growth in system functionality and the expansion of application areas. Career perspectives are excellent, in all areas of the manufacturing world, throughout Europe and particularly in the Netherlands. Europe is home to some of the leading companies in automotive technology (Daimler, BMW, BOSCH), avionics (Airbus) and consumer electronics (Siemens, Philips), and embedded systems play important roles in all of these systems.

The Netherlands has also acquired a strong position in embedded systems due to the presence of such companies as Philips, NXP, ASML and Océ. There are also numerous careers for embedded systems engineers in academia, where these skills are in high demand as well.

There is a close connection between TU Delft and the Industry. During your studies you will get the opportunity to get in contact with High tech SME’s via internships and thesis projects, but also via the EEMCS recruitment days and the technical career fair where you can get you first job interviews.

I am the head of the Embedded Software group that focuses on the software side of embedded systems, with special emphasis on wireless devices. The combination of small, resource scarce devices and the error prone nature of wireless communications constitutes an interesting research challenge with regard to designing and implementing robust software that can operate autonomously in a wide range of conditions. Exhaustive testing by individual developers (as is common practice in the industry) is not enough, as the number of system states is growing exponentially with the number of networks and other devices involved. In this regard, one of the PhD students is developing a software-testing framework based on the concept of crowd sourcing. He is developing an Android application that participants can install on their smartphones, thus allowing researchers to use it, as one of a large pool, to run novel software on as many phones as possible in order to speed up the development cycle. This example is typical of the Embedded systems group’s philosophy of conducting experimental research. In this vision, it is fine to develop high-level concepts, but it is only by implementing them on real hardware that we can discover whether they can withstand the many intricacies of embedded systems found in practice. Accordingly, students in the MSc programme in Embedded Systems receive hands-on training through a variety of projects and labs, of which the quad-rotor project run by the ES group is arguably the most prominent example.
Admission requirements and application procedures

Dutch BSc degree
If you hold a Dutch BSc degree closely related to the Master’s programme, you will 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 from a non-technical Dutch university go to www.studychoice.nl If you completed your bachelor’s at a technical university, go to www.doorstroommatrix.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 to the required level. You can do this during your HBO programme by means of a bridging programme after completing your HBO diploma. Entrance requirements for mathematics and English (some exceptions) apply for 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 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. 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’ 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.

For general information, please contact:
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Please visit the webpage for all details, complete requirements, deadlines and contact information, please visit:
www.tudelft.nl/mse

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