Crucial for the acquisition of signals and the extraction and interpretation of the information that the signals carry.

Signal analysis and processing plays an important role in integrated electronic systems, being crucial to the acquisition of signals and the extraction and interpretation the information that the signals are presumed to carry.

Signal processing is also used to interpret the nature of physical processes based on the observation of either a signal or the manner in which the process alters the characteristics of a signal. Electrical engineers who specialise in signals & systems design and develop electronic systems over a wide range of applications. Examples include the development of medical equipment, wireless communication systems, radar and remote-sensing systems, large antenna arrays for radio astronomy and control systems.

**Programme**
The Master of Science programme in Electrical Engineering at TU Delft offers the track Signals and Systems. In this MSc track, you will be trained to develop and apply theory and algorithms in the broad field of signal processing and system design. The programme offers you the possibility to specialise more specifically in any of several particular aspects of signal processing, including multimedia, communications, biomedical, remote sensing & radar systems and for control systems. The programme starts by providing students with a solid foundation and in the second semester you will learn about parameter estimation and detection. When selecting courses and a graduation project, you can choose out of several specialisations. Graduation work can be done either at Delft University, or in industry and other (international) universities.

**Track**
**Signals & Systems**

<table>
<thead>
<tr>
<th>Diploma</th>
<th>Master of Science Electrical Engineering</th>
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</thead>
<tbody>
<tr>
<td>Credits</td>
<td>120 ECTS, 24 months</td>
</tr>
<tr>
<td>Starts in</td>
<td>September</td>
</tr>
<tr>
<td>Language of instruction</td>
<td>English</td>
</tr>
<tr>
<td>% International students</td>
<td>69%</td>
</tr>
</tbody>
</table>

Faculty of Electrical Engineering, Mathematics and Computer Science

MSc Programme
Electrical Engineering
When searching a Master’s programme, I was looking for a combination between theoretical mathematics and applied science. As I liked Electrical Engineering, I looked into that field and discovered that the Signal & Systems track meets the perfect combination between theory and practice. The track covers many fields such as radar systems, acoustics, and communications. As part of my internship and graduation work, I had the opportunity to do research at two companies: Thales and Bang & Olufsen. During this research period, I worked with two different fields: signal processing and remote sensing applications (antenna array pattern synthesis; space-time adaptive signal processing in ultra-wideband arrays; detection and feature extraction; tracking and navigation; classification, and imaging) that are performed at either a single node or at a distributed sensing.

Systems and Control focuses on the development of mathematical models of complex dynamic systems, as well as on the use of these models to optimise/ control their behaviour in feed-forward and feedback configurations. The strength of feedback control rests in its capacity for dealing with uncertainty. This makes it possible to design low-complexity controllers for achieving high performance in controlled complex systems.
Examples of graduation projects

◆ Speech enhancement for improving speech intelligibility for hearing impaired people
◆ Detection and tracking of multiple targets in a distributed active sensor system
◆ ECoG signal analysis for the early detection and prevention of an epileptic insult
◆ Distributed control of the next generation of Extreme Large Telescopes

Career prospects
The career prospects for Signals & Systems graduates are very good. 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 company’s via internships and thesis projects, but also via the EEMCS recruitment days and the technical career fair where you can get your first job interviews. With their solid theoretical and engineering background, graduates of the programme have a broad selection of career paths in both the academic and the industrial domains. The programme provides an excellent foundation for careers in research, development and consultancy, as well as for commercial and management positions. Our graduates are working in mid-sized and large companies as researchers, developers and consultants. They have found employment opportunities in prominent firms that are active in the Netherlands (e.g. Philips, Bosch Security Systems, ASTRON, Ericsson, TNO and ASML), as well as in global firms, including hearing-aid producers Oticon and Siemens, mobile phone manufacturers (e.g. Nokia, Samsung and Ericsson) and other highly regarded firms (e.g. Google, NXP Semiconductors and Bang & Olufsen).

Recent developments in technological capabilities have made microwave sensing affordable for a mass market. In addition to its application in meteorological institutes and other professional users, microwave sensing can be found in collision avoidance radar systems in cars and in food control. The system-design paradigm has shifted from complex, stand-alone systems to distributed systems of wirelessly connected low-functionality sensors. It has also shifted from mono-functional wireless systems (e.g. communications, radar and navigation) to multifunctional ones. This shift has triggered intensive research on resource allocation, distributed signal processing and capability management in such systems. The Microwave Sensing group focuses on electromagnetic modelling and the optimal selection of sensing waveforms. In our research projects, we collaborate closely with signal processing specialists and RF technology groups. We apply the research in area surveillance, crowd monitoring, landmine detection, concealed-weapon detection, weather prediction and civil engineering (subsurface sensing).

Students enrolled in the Signals and System group have access to state-of-the-art experimental research facilities, including electromagnetic laboratories and a multi-media signal laboratory, as well as software-defined and ultra-wideband radar systems located in Delft and Cabauw.
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.
   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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EEMCS Faculty
Mekelweg 4
2628 CD Delft
www.tudelft.nl/ewi

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

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November 2017