Microelectronics play a crucial role in all fields of innovation. The ever-increasing demand for processing power, sensing capabilities and miniaturisation makes microelectronics the most innovative field of all.

For example:

- Chipmakers are pushed to develop new and reliable processes that allow the integration of hundreds of millions of transistors onto a single microchip.
- Analogue designers are challenged to build accurate circuits from clearly nonideal transistors. Digital designers face problems with regard to the design, layout and testing of highly complex circuits.
- System designers must meet the requirements of application environments that are often multidisciplinary.

The MSc track in Microelectronics provides electrical engineers with the highly specialised knowledge and experience to design, fabricate and test devices, circuits and systems. The department is internationally renowned for its research on smart sensors, microsystems, semiconductor fabrication, solar cells, signal processing, RF transceivers and RF components. This MSc programme in Microelectronics provides you with the opportunity to transform your own ideas from theory to application in the department’s own clean room and, quite often, gives you a platform to present your work at international conferences. The range of facilities also encourages fruitful discussions between design oriented and technology-oriented students.

**Track**

**Microelectronics**

**Diploma**

Master of Science
Electrical Engineering
Track: Microelectronics

**Credits**

120 ECTS, 24 months

**Starts in**

September

**Language of instruction**

English

**% International students**

65%
I am a master student in Electrical Engineering with a research interest in electro-mechanics and Nanoelectronics devices, which deals with the design, fabrication and characterization of electronic circuits/systems at micro or nano scale. The courses, assignments and project deadlines make the overall scenario of the master Nanoelectronics a bit challenging. With time, this accumulates to give you the confidence, knowledge and experience necessary to continue researching in a research area you might like. Apart from the motivating academic ambience, the faculty gives you 9-12 months for a thesis project, which can be chosen from a plethora of research opportunities available from both the faculty and industries. My research has been supported by 3 groups – Else Kooi Lab (TU Delft’s micro-manufacturing lab) Kavli Institute of Nanoscience and NXP semiconductors. I graduated with a not-so-easy but definitely a unique and rewarding experience with TU Delft. TU Delft is an internationally recognized university and it directly reflects how good an engineer you are.

Lalit Kumar (India)
Career prospects

The job prospects for microelectronics graduates are excellent, and they have a wide choice of career paths. 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 companies 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. Many of our graduates are working as Managers of technological innovation processes, Entrepreneurs, IT Strategy Consultants, Project managers, (IT) Consultants, Business Process Developers, Financial Analysts, Service managers etc. Our alumni work in leading electronics companies including Philips, NXP, Broadcom, ASML, Nokia, National Semiconductor, Maxim, Analogue Devices, Philips Healthcare and BioMetrix. The combination of a solid engineering background and the wide application field of microelectronics makes many other career perspectives possible as well. Graduates can also choose an academic career, continuing their education and pursuing a PhD.

I am a professor of Micro/nanoelectronics, System Integration and Reliability (MSI&R). My main research interests include heterogeneous, multi-level and multi-functional micro/nanoelectronics, system integration and reliability. The field of MSI&R is interesting, because of its economic and social importance and the scientific challenges that it presents. Through technology, we create high-value, industrialised and reliable smart systems, including wafer, packaging and assembly processes. In terms of science, we develop cross-disciplinary knowledge aimed at explaining and predicting the behaviour of micro/nanoelectronics systems, including material science, electronic engineering and mechanics. Taking MSI&R as our core value tree, our multi-level students work in various branches, tailored to their personal interests. Some work with novel 3D-interconnecting technology (e.g. nano-Cu and TxV interconnections), whilst others work with the wafer-level integration of LED devices with sensors and electronics, and yet others are involved with the reliability of components and systems. In addition to our own world-class research infrastructure (e.g. DIMES clean rooms), we have direct access to the top-ranking infrastructure of the Chinese State Key Lab and the TU Delft-Beijing Research Centre. We actively participate in relevant EU-funded research programmes, as well as in Dutch and Chinese national R&D programmes. Our students benefit from our excellent research facilities, strong international networks and close cooperation with the leading industries and research institutions around the world. Our objectives are to provide an excellent developmental platform for highly talented students and to develop future leaders in the area of R&D. By joining us, you will learn as much as you can – as quickly as possible – whilst enjoying your life, together with an enthusiastic, ambitious, committed and pleasant team!
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 upon 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 completing a bridging minor, or by means of a bridging programme after completing your HBO diploma. Entrance requirements for mathematics and English (some exceptions) apply for both the bridging minor and 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
   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.