

# Electrical Engineering Microelectronics

## MSc Programme



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.

Degree	Master of Science
Starts	September
Type	full-time
Credits	120 ECTS, 24 months
Language	English
Application deadline	1 April (International BSc degree) 1 July (Bridging programme*) 1 September (Dutch BSc degree)
Tuition fee	€ 18.750 (non-EU applicants) € 2.168 (EU applicants)
Scholarships	<a href="https://www.tudelft.nl/scholarships">scholarships.tudelft.nl</a>

The MSc programme in Microelectronics provides you with the opportunity to transform your own ideas from theory to application in the 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.

The professors are internationally renowned for their research on smart sensors, microsystems, semiconductor fabrication, solar cells, signal processing, RF transceivers and RF components.

### Programme

The Master of Science programme in Electrical

Engineering offers the track Microelectronics. The programme, covers the entire spectrum of microelectronics, ranging from technology and devices to analogue and digital circuits, sensors, systems and microsystems. The programme will provide you with academic skills, broad fundamental courses, microelectronic key courses.

The wide array of specialisation courses allow you to deepen your knowledge and skills in the direction of your choice. The free elective space allows you to broaden your scope to other areas. As a result you will be a broadly educated professional, able to develop innovative solutions to a wide range of technical and societal problems.

First Year (60 EC)			
1 <sup>st</sup> quarter	2 <sup>nd</sup> quarter	3 <sup>rd</sup> quarter	4 <sup>th</sup> quarter
Profile Orientation & Academic Skills		Systems Engineering	
Core courses (common core and track specific core)	Core courses	Core courses	Core courses
		Specialisation courses	Specialisation courses
Specialisation courses	Specialisation courses	Free elective courses	Free elective courses
Second Year (60 EC)			
1 <sup>st</sup> quarter	2 <sup>nd</sup> quarter	3 <sup>rd</sup> quarter	4 <sup>th</sup> quarter
Specialisation courses	Graduation project (45 EC)		
Free elective courses			

For more information on all courses, please visit: [www.studyguide.tudelft.nl](http://www.studyguide.tudelft.nl)

## Specialisations

Within the track microelectronics you can deepen your knowledge within one of the six specialisations.

**Microsystems & Technology** focusses on all aspects of integrated microsystem development. It comprises design and technology for sensors, actuators, MEMS components and addresses device and system integration and application specific packaging.

**RF Circuit Design** prepares you to become a skilled RF designer. Focus is placed on the analogue, microwave, digital and mixed-signal techniques that characterize the RF/wireless systems of today and tomorrow.

**Analog Circuit Design** focuses on the design of precision analog and mixed signal circuits. It concentrates on lowpower, low voltage amplifier and AD converter design for sensor interface electronics.

**Biomedical Electronics** concentrates on the design and development of circuits and (micro-)systems for biomedical applications.

**Digital Systems** covers theory and design methodologies for digital circuits and systems, with application areas in wireless communication, biomedical imaging, quantum computing and 3D IC design.

**Quantum Electronics** focuses on the theory and design of quantum computer systems where classical hardware and software infrastructure is used to communicate with and operate quantum hardware.

## Master thesis

The master's thesis is the final challenge. You will have to demonstrate your capacity to successfully carry out a research project. These projects can be completed during an internship at a company. Instead of doing free elective courses, it is possible to extend your graduation project. You can complete the entire project by successfully presenting the results during a public presentation.

Some examples of recent graduation projects are:

- Analysis and Design of MHz-range Wireless Power Transfer Systems for Implantable Devices.
- Low Temperature Wafer Bonding Based on Copper Nanoparticle Sintering for 3D Interconnect Fabrication.
- Low Power, All-Digital Fractional-N Frequency Synthesizers for Multi-GHz Applications.
- The design of a 16\*16 pixels CMOS image sensor with 0.5 e- RMS noise.

## Career perspective



**Companies**  
ASML, Philips, TNO, NXP



**Positions**  
Graduates can choose from a number of career paths with attractive positions open to starting engineers information technology, operations