

# Embedded Systems

## MSc Programme



Innovations made possible by embedded systems are making our lives healthier, interesting, safer and more sustainable. Examples of systems in which embedded systems play a crucial role are: smart phones, medical equipment, cars, traffic control, airplanes, robots, etc. These innovations are at the heart of industrial innovation and competitiveness, creating and sustaining jobs and economic well-being.

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

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, machine learning 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.

### Programme

Within the Embedded Systems programme you will obtain basic knowledge through courses on computer architectures for embedded applications, formal verification and real-time operating aspects. By means of a team project you will experience how all these parts come together when designing an embedded system in practice. Depending on your interest, you will learn more about topics like IC design, heterogeneous computer platforms, network security, wireless sensor networks, internet of

First Year (60 EC)			
1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter
System Validation (5 EC)	Modern Computer Architectures (5 EC), Quantitative Evaluation of Embedded Systems (5 EC)	Real-time Systems (5 EC)	Embedded Systems Lab (5 EC)
Specialisation courses (max. 50 EC), e.g. Internet of Things seminar, Introduction to High Performance Computing, Sensor and Actuators, Real-Time Software Development, Digital Signal Processing, Security and Cryptography, Network Security, Smart Phone Sensing, Software Architecture, Distributed Algorithms, Algorithms for Planning and Scheduling, Advanced Computing Systems, Optimization in Systems and Control, Control System Design, Knowledge Based Control Systems, Control Systems Lab, Artificial Intelligence Techniques.			
Also part of it may be: homologation courses (max. 10 EC), internship (max. 15 EC.) and/or a few non-technical courses.			
Second Year			
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)		

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

things, and mechatronic system design.

Three different specialisation profiles have been defined. Each student has to select at least four different courses from one of the specialisation profiles being Software & Networking, Computer Architecture, and Control Systems.

- Software & Networking focuses on the software that is used for embedded systems as well as on network architectures and algorithms that are used in embedded systems.
- Embedded Computer Architectures focuses on hardware architectures for embedded processors.
- Embedded Control Systems focuses on control theory and control systems that are used for embedded applications.

You have the possibility to do an internship at a company as part of the free electives. You can come with a proposal, but the professor can also help you to find internship possibilities.

## Master's Thesis

The Thesis project is the last study unit of the programme and serves to prove that you acquired the academic competencies of a Master of Science in Embedded Systems. The project involves a research or design task with sufficient academic level. The project may be executed within a research program at TU Delft, or in a suitable research institute or company.

Some examples of recent graduation projects are:

- Communicating Embedded Networks with Visible Light Communication.
- Delfi-n3Xt's Attitude Determination and Control Subsystem: Implementation and verification of the hardware and software.
- A Cow-Feeding Robot.
- Handshake Recognition Applied to Wireless Data Exchange in Smartbands.
- Indoor Localization and Tracking of Mobile Objects in a Healthcare Facility.

## Career perspective



### Companies

Philips, ASML, NXP, Siemens, Airbus, BOSCH, BMW, Daimler, Fox-IT, Robot Care Systems, Academic Careers



### Positions

Engineering, research & development, academic career