MASTER OF SCIENCE IN ELECTRICAL ENGINEERING (ELECTRONIC CIRCUITS AND SYSTEMS)

120 ECTS CREDITS - LANGUAGE: ENGLISH

Masters of Electrical Engineering are capable of developing complex electronic (communications) systems for a broad field of applications efficiently and methodically, starting from the conception and analysis over the design, implementation, testing, and up to the management of such systems.

WHAT

An electrical engineer is at the forefront of technological innovation in advanced electronic systems. They drive the evolution towards 'smart' environments consisting of interconnected devices, sensors and systems. Some pertinent applications include remote surgery, 6G communication, smart cities, smart grids, industry 4.0, robot swarms, satellite constellations, and autonomous vehicles. These all require specific electronic hardware, sensors, real-time signal processing, and fast communication, designed, built and managed by electrical engineers.
Electronics and digital applications are integrated in every aspect of our daily lives. The future of our society, industry, healthcare, and communication infrastructure depends on innovative solutions that enhance the functionality, efficiency, and connectivity of electronic systems, information processing, and networks. These advancements are crucial for addressing the challenges posed by the exponential growth of data, the rise of artificial intelligence, the need for high-quality and affordable healthcare, for competitive highly automated manufacturing industries, and for the pursuit of a sustainable and safe future. The Master of Science in Electrical Engineering offers in-depth training in the domains of electronic system engineering, treating both hardware and software aspects but with a clear focus on the underlying electronic components and advanced circuits, system architecture and signal processing. Students specialise either in Electronic Circuits and Systems (ECS) that form the hardware of smart devices and equipment or in Communication and Information Technologies (CIT) that create the connectivity and information processing for those devices to build much more powerful systems.
Students learn how electronic hardware works exactly and how to design such hardware, how communication and navigation systems function and how these need to be adapted to increasingly complex environments, how wearable sensors and remote sensing enable personal healthcare, how circuit design innovates with continuously advancing semiconductor technology, how the combination and co-design of electronics and photonics create new sensors and transceivers, how new devices target the exploitation of sub-terahertz and terahertz frequencies for new sensing and communication applications, how more advanced digital signal processing and algorithms are enhancing energy efficiency and system performance...
Specialising in Electronic Circuits and Systems (ECS) provides thorough insight into semiconductor technology, chip design, and the integration of chips in microsystems and transceivers. Students learn to develop complex electronic systems for various applications, from conception and analysis to design, implementation, and testing. The programme provides a strong theoretical and technological foundation, hands-on design experience with state-of-the-art tools and equipment. The acquired research competences prepare the students to drive creative and innovative (r)evolutions in industry and academia.
Moreover, this study programme provides a broad non-specialist knowledge in other engineering disciplines and in several economical, legal, deontological, ecological, and societal aspects. On top of a sound theoretical base, every year of the programme includes practical projects that gradually enhance your skills in effective teamwork and in acting as skilled team leaders in an industrial research environment.

STRUCTURE

The Electrical Engineering programme consists of two phases: a three-year Bachelor's degree followed by a two-year Master's degree. Throughout the Master's programme, students can deepen or broaden their scope by choosing from a wide range of elective course units or by including a broadening minor into their curriculum.

LABOUR MARKET

The programme focuses specifically on research and development, as well as on creation and design in the field of electronics and ICT. Many companies seek electrical engineers for developing smart systems and are therefore constantly looking for highly trained graduates. The balanced mix of analogue and digital circuit and system design, signal processing and communication technology on a strong theoretical foundation enables graduates to

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play key roles in the development of such smart devices and systems and to provide solutions addressing societal challenges as well.
Electrical engineers design and develop advanced chips, information processing systems (for e.g. speech, sensor data, video), wearables, measurement and sensor technology (for e.g. healthcare, vehicles, robots), and future ICT infrastructure, including wired, wireless, satellite and vehicular communication systems. Our graduates thrive in large multinational electronics, ICT, telecommunication, space and research oriented companies, as well as in a wide range of small and medium-sized enterprises active at the forefront of technology or consultancy. Their expertise in electronics hardware, signal processing and system design, is highly valued for its broad scope and strong connection to state-of-the-art research and technology.

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TOELATINGSVOORWAARDEN VOOR HOUDERS VAN EEN VLAAMS DIPLOMA

1 **Rechtstreeks:**
- Bachelor in de ingenieurswetenschappen, afstudeerrichting: elektronica en informatietechnologie
- Bachelor in de ingenieurswetenschappen, afstudeerrichting: elektrotechniek
- Bachelor in de ingenieurswetenschappen: elektrotechniek

2 **Rechtstreekse toelating voor het volgen van een brugprogramma (horizontale instroom):**

a opleidingen nieuwe structuur:
- Master in de industriële wetenschappen: elektronica en ICT: elektronica
- Master in de industriële wetenschappen: elektronica en ICT: ICT
- Master in de industriële wetenschappen: elektronica-ICT (zonder afstudeerrichting)
- Master in de industriële wetenschappen: elektronica-ICT, afstudeerrichting: ingebedde systemen
- Master in de industriële wetenschappen: elektrotechniek
- Master in de industriële wetenschappen: energie
- Master of Electronics and ICT Engineering Technology

b opleidingen oude structuur:
- Industrieel ingenieur in elektronica

Additional Information on Admission (Flemish Degree)

Information for holders of an academic Bachelor's degree which grants no admission to the programme: there are no longer any preparatory courses organized that give access to the Master's programme in *Electrical Engineering*.
Students who have obtained a Flemish academic bachelor's degree in a closely related field of study (as listed above) can submit a request for exemptions in the *Bachelor of Science in de ingenieurswetenschappen: elektrotechniek* which gives immediate admission to the master's programme. More information: studietrajectIR.ea@ugent.be.

ADMISSION REQUIREMENTS FOR INTERNATIONAL DEGREE STUDENTS

Students who wish to enrol for the Master of Science in Electrical Engineering can enter the programme without any prerequisites if they hold the following diploma: an academic diploma of Bachelor (or Master) of Science in Engineering (university level, minimum of three years), with the main subject in Electrical Engineering or an equivalent to this.
Admission can only be granted after an individual application procedure. The Study Programme Committee will make the final decision whether to accept the application or not. The Study Programme Committee can decide that students need to follow a preparatory course or an individual master's programme, for instance for students with another diploma of Bachelor or Master.
Important: Students who wish to enrol must add the result of a GRE test to their application, more specifically the result of the Quantitative Reasoning of the General Test. The GRE test result will be assessed using the faculty's grading scale.
Information on admission requirements and the administrative procedure for admission on the basis of a diploma obtained abroad, can be found on the following page: www.ugent.be/prospect/en/administration/enrolment-or-registration.

LANGUAGE REQUIREMENTS

Language requirements	Dutch: no language requirements English: CEFR level B2

The language requirements for this study programme can be found on: www.ugent.be/languagerequirements

PRACTICAL INFORMATION

Study programme

studiekiezer.ugent.be/master-of-science-in-electrical-engineering-electronic-circuits-and-systems-en/programma

Information sessions

Graduation Fair

afstudeerbeurs.gent/en/students/further-studies

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FACULTY OF ENGINEERING AND ARCHITECTURE

2026-27

Enrolling institution

Information on enrolment at Ghent University.

Application Deadline (for International degree students)

For students who **need a visa**: before 1st of April
For students who **do not need a visa**: before 1st of June
Read more

Tuition fee

More information is to be found on: www.ugent.be/tuitionfee

Learning path counsellor
studietrajectir.ea@ugent.be

Contact (for international degree students)
International Relations Officer
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