Master of Science in Electrical Engineering

Options:
- Electronics and Integrated Circuits
- Embedded Systems and Multimedia

Faculty of Engineering
Why choose Electrical Engineering at K.U.Leuven?

The Master of Science in Electrical Engineering programme is a comprehensive course of study providing graduate students with the foundational knowledge needed to pioneer the next generation of networked integrated systems. Students from around the world are drawn to the programme’s excellent faculty, comprehensive curriculum, stimulating learning environment and state-of-the-art research facilities.

The next generation of ICT infrastructures will undoubtedly be built on complex integrated systems. These systems will depend on miniature devices omnipresent in the digital environment. Their backbone will be complex servers, routers and complete computing farms communicating over both wired and wireless networks. The applications executed by these systems will be rich in multimedia content and will require system-wide security and privacy features. Our goal is to teach students the technical skills and methods they need to contribute to the creation of this and other future ICT infrastructures. The courses are state-of-the-art and the professorial staff are active in both teaching and research. This close link between education and research exposes students to challenging and ground-breaking topics during their coursework and Master’s thesis research.

Why Leuven?

The city of Leuven has around 90,000 inhabitants. Add to this 35,000 students and it should come as no surprise that young faces fill the streets of a city tuned to the students’ rhythm. Leuven is located in the centre of Belgium, 25 km from the capital city Brussels and 15 km from Brussels airport. It is a perfect base for trips within Belgium and abroad. Leuven is an important hub in the Belgian railway network, with Paris, London and Amsterdam only a couple of hours away by train. A bus pass gives you free access to the regular bus lines running within the area of Leuven, but because the city is so compact, cycling is usually the quickest way to get around.

K.U.Leuven and the city of Leuven grew together over the centuries, meaning that town and gown are strongly linked. Student apartments, dorms, cafeterias, entertainment and sports accommodations are integrated into the city.
Why K.U.Leuven?

Situated at the heart of Western Europe, K.U.Leuven has been a centre of learning for almost six centuries. Founded in 1425 (by Pope Martin V) and thus the oldest university in the Low Countries, K.U.Leuven quickly grew into one of the largest and most renowned universities in Europe. Its academic fame has attracted numerous scholars who have made valuable contributions to European culture. Illustrious examples include the humanist Erasmus, the philologist, legal scholar and historian Justus Lipsius, the mathematician Gemma Frisius, the cartographer Gerard Mercator (whose map projection is still in use), the botanist Rembert Dodoens, and the father of modern anatomy, Andreas Vesalius.

Such a rich history has provided the basis for K.U.Leuven’s own dynamic international acclaim. Today, international cooperation is regarded as essential for a modern university. Top-level research is judged according to international standards and implies interaction, cooperation and exchange among researchers and results. As such, European surveys rank K.U.Leuven among the top-ten European universities in terms of scholarly output.

K.U.Leuven currently caters to more than 31,000 students, around 12% of whom are international students from more than 120 countries. Most international students are enrolled in Master’s and PhD programmes. Approximately 50% of the PhD students at the Department of Electrical Engineering are from abroad.

K.U.Leuven is also a comprehensive university comprising a wide range of faculties and departments with closely linked research centres. Exemplifying this comprehensive ethos, the Department of Electrical Engineering collaborates closely with the medical school, and with research centres such as IMEC, IBBT (Interdisciplinary Institute for Broadband Technology) and VIB (Flanders Institute for Biotechnology).

Profile

The programme assumes basic knowledge of electrical engineering (e.g., basic transistors and logic design, digital signal processing, systems and control). The Master of Engineering: Electrical Engineering programme gives you in-depth training in software and hardware design of electronic systems, with an emphasis either on circuit design or application design. In the option ‘Electronics and Integrated Circuits’, you will learn how to design and create electronic and integrated circuits for a wide range of electronic systems in telecommunications, audio- and sensor applications, biomedical systems and power electronics. In the option ‘Embedded Systems and Multimedia’, focus is placed on the design of novel applications. This encompasses the processing, transmission and security aspects of digital signals (with emphasis on multimedia) and their implementation in embedded systems. Your Master’s thesis project, carried out in close cooperation with the department’s on-going research, will expose you to the cutting-edge research topics in these fields.
Admission requirements

Admission procedure
Students apply to K.U.Leuven using the general application form. The application package must include the following:

- Copies of documents as required by K.U.Leuven (see the application website: www.kuleuven.be/application)
- Proof of proficiency in English: an IELTS or TOEFL score that meets or exceeds the minimum requirements set by K.U.Leuven (see the application website)
- GRE scores (strongly encouraged)
- Motivation letter: A one-page letter in which you describe your motivation to take part in the programme
- Two letters of recommendation attesting to your academic achievement

Career prospects

The Department of Electrical Engineering (ESAT) is the university's largest department and was the starting point of IMEC and many spin-off companies. The faculty also has excellent professional connections with industry leaders. Given the programme's strong link between education and research, employment perspectives for programme graduates are excellent - and not only in Belgium, but also in Europe and the rest of the world. Our graduates are in very high demand.

Programme

The Master's programme has two tracks, ‘Electronics and Integrated Circuits’ and ‘Embedded Systems and Multimedia’. When registering for the first year, you choose tentatively which track you would like to follow. The final choice is made at the end of the first semester.

During the second year, you write a Master's thesis comprising 24 credits. You may choose from a large selection of research topics compiled by the programme's teaching staff. You will be supervised individually by a full faculty mentor and a daily supervisor throughout the thesis-writing process.
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Each option also has a design seminar, integrating different courses.

Option-specific elective courses 9-18
The student chooses at least 9 credits from the other option and/or from predefined sets of elective courses. These courses cover topics like biomedical information technology, data mining, modelling & optimisation, power electronics, security, semiconductor physics & technology, and telecommunications.

Master's thesis 24

Broadening education 6-15
- Dutch Language and Cultures 3
- 3 to 9 credits from a list of general interest courses
- Internship and/or other elective courses

For detailed descriptions of this programme's courses and for the course timetable, please consult www.kuleuven.be/coursecatalogue
Learn more

www.kuleuven.be/ma/mee

General information

International programmes: www.kuleuven.be/internationalprogrammes
International Office: www.kuleuven.be/english

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This brochure provides the most complete and accurate information available concerning Master's programmes offered at K.U.Leuven. Amendments to the composition of this programme may, however, be approved at any time. Consequently, K.U.Leuven is in no way legally bound by the information provided in this brochure. The most recent information on all our academic programmes can be consulted at www.kuleuven.be/coursecatalogue

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