



VRIJE
UNIVERSITEIT
BRUSSEL

Joint programme with



**MASTER
OF SCIENCE IN
ELECTRICAL
ENGINEERING**

www.vub.ac.be/electrical-engineering
www.bruface.eu

**120
ECTS**

2018-2019

WHY VUB

VUB education delivers strong individuals, critical minds and world citizens

Vrije Universiteit Brussel (VUB) offers high-quality English-taught programmes, supported by outstanding research. Being a student at VUB means learning in an open atmosphere of tolerance and diversity, as well as growing into an independent and critical-thinking individual.

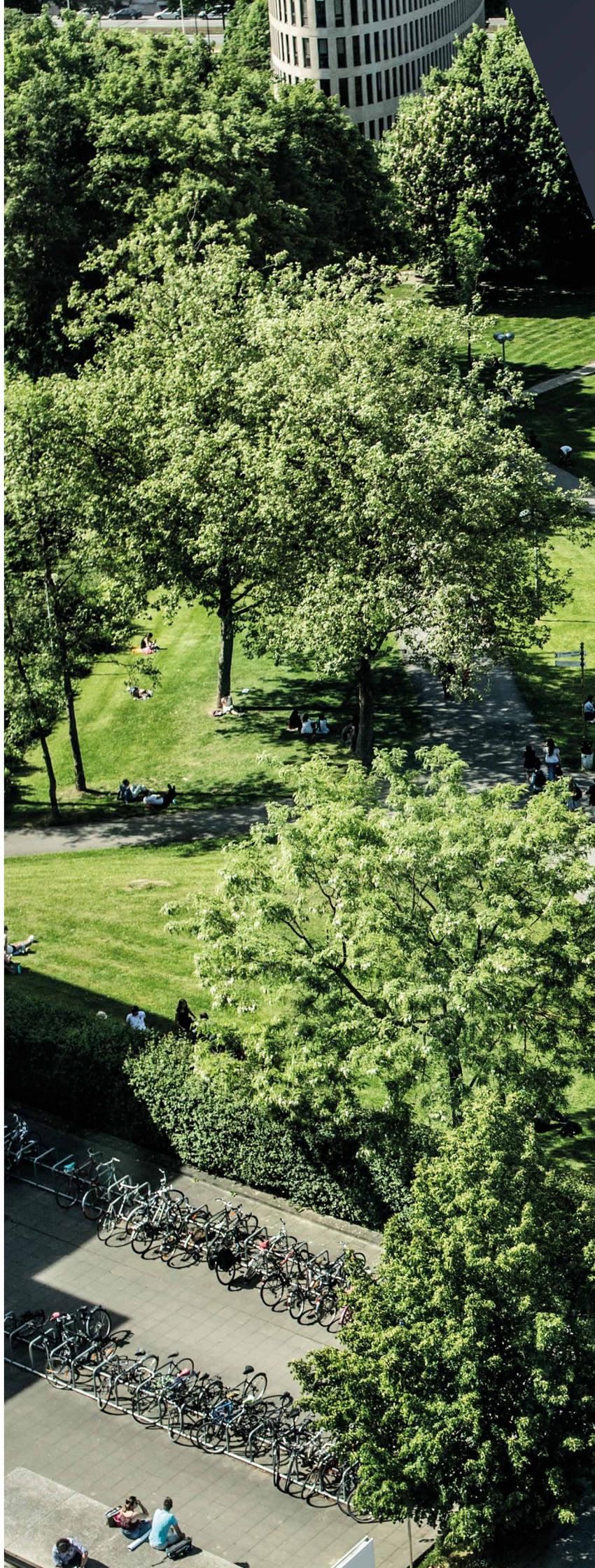
All fields of study are offered on four student-friendly campuses in the cosmopolitan city of Brussels. At VUB, students have easy access to their lecturers and assistants. Faculty members are available and open to answer questions; small group workshops are used to ensure close interaction and hands-on experience.

VUB is a dynamic and modern university with almost two centuries of history. We welcome 15.000 students, 21% of which are international students from more than 120 different countries.

The basis of our academic success

Vrije Universiteit Brussel was founded on the principle of 'free inquiry' as formulated by the French mathematician and philosopher of science Henri Poincaré (1854-1912): *"Thinking must never submit itself, neither to a dogma, nor to a party, nor to a passion, nor to an interest, nor to a preconceived idea, nor to anything whatsoever, except to the facts themselves, because for it to submit to anything else would be the end of its existence."*

Personal growth, with a positive and critical attitude, in addition to a sense of responsibility and open-mindedness are characteristics that you will encounter in everyone at the university: from professors and researchers to students and staff members. It lies at the heart of our academic success.





**Information technology:
omnipresent and ever-evolving**

Electronics and information technology spans a broad range of topics related to omni-present systems and devices: smartphones, laptops, robots, games, cars, medical imagers, solar farms, the 'Internet of Things', and so on. At VUB you can become an expert in this field, ensuring a career in an ever-evolving aspect of society. The programme combines a rigorous scientific and technical education with the development of practical skills. It encourages independence, creativity and inventiveness, and it shapes competent engineers who can contribute to society on many – if not all – levels.

This programme is part of Bruface, which means it is organised jointly with Université Libre de Bruxelles. This allows students to use the adjacent infrastructures of both institutions, as well as giving them the opportunity to study in a multicultural context. Study in Brussels, the beating heart of Europe, and help build the future.



ELECTRICAL ENGINEERING WITH A FOCUS ON ELECTRONICS AND INFORMATION TECHNOLOGIES

From components to systems

Being an engineer means keeping in touch with the ever-changing needs of society. Electronics and informatics have an enormous impact on global industry, economics and worldwide trade. This programme offers students a practice oriented research track where they enhance their researching skills while contributing to technological and scientific innovations. Graduates have a profound theoretical knowledge of the possible applications of electronics and information technology – from component all the way up to system level.

Research is the key to innovation

The engineering department encourages students to actively participate in research activities. With more than 100 researchers working on a wide range of research projects, you are sure to find a project that interests you. You will get the opportunity to team up with our researchers and develop new, cutting-edge technologies. The involved departments work with high-tech companies and research centres, ensuring that your research results will contribute to society. If you would like to do your own research, you can also pursue an academic career and get your PhD at VUB. Some PhD students have even managed to start successful university spin-off companies, based on their master and PhD research results.

Plenty of job opportunities

Technology is a key component in today's society and the rapid evolutions in this field ensure that there's never a shortage of job opportunities. Graduates are ready for the international job market because of their thorough training with English as the working language. The job possibilities are virtually endless; 90% of students enrolled in the programme receive interesting job offers before they graduate. VUB helps them take their first steps on the job market with workshops, networking events, job fairs and tips for job interviews. It's all an ambitious student needs!

Bruface: best of both worlds

The Master of Science in Electrical Engineering is a Bruface master. Bruface, short for Brussels Faculty of Engineering, is a cooperation of the Vrije Universiteit Brussel (VUB) and Université Libre de Bruxelles (ULB). The two universities in the city of Brussels join forces to offer English-taught programmes in the field of engineering.

The Master of Science in Electrical Engineering is a Bruface master. Bruface offers you the opportunity to study in an international context and to make use of the best facilities of both universities. But most of all, this cooperation allows for expertise of both universities to be at your disposal. High-level education is within reach, at a reasonable tuition fee. At the end of the programme, you even take home a joint degree from VUB and ULB.



MASTER YEAR 1	ECTS	MASTER YEAR 2	ECTS
Compulsory courses Communication Networks: Protocols and Architectures Sensors and Microsystem Electronics Digital Signal Processing Digital Architectures and Design Analog Electronics Communication Channels Image Processing Microprocessor Architecture Modulation and Coding Measurement and Identification Control System Design Signal Theory	56	Compulsory option packages Option 1: Nano-, Opto-electronics and Embedded Systems Option 2: Information and Communication Technology Systems Option 3: Measuring, Modelling and Control	24
Elective courses (students must select 4 ECTS) Operating Systems and Security Project Electronics and Telecommunication	4	Elective courses Elective courses (possibly including internship)	12
		Master Thesis	24

The programme is subject to change. Check www.vub.ac.be/en for the latest information about the programme.

ECTS (European Credit Transfer System): 1 credit represents 25-30 hours of study activity.

INTERNSHIPS

Between the first and the second year, students can take up an internship worth either 6 ECTS (40 working days) or 10 ECTS (60 working days). The student can get actively involved in a real company where they carry out real tasks and are expected to integrate and communicate in a work team, gaining industrial engineering competences through real-life situations in a professional context. This can take place in- or outside Belgium, as long as the theme is related to the professional life of an engineer in the enterprise of choice. It can be a laboratory or a research institute – not including university laboratories in Belgium. Students can even link their internship to their master thesis. To avoid interference with studies in the second year, students are advised to plan their internship as much as possible during the summer holiday between the two master years.

ELECTIVES

Students can also choose to postpone the company experience until after the master programme, and choose 12 ECTS from the more than 20 electives courses offered by the academic staff and their research groups. The electives have a wide variety of subjects, covering more in-depth specialisation as well as topics like entrepreneurship and even languages.

BUILDING THE FUTURE

3D SENSORS: THE FUTURE IS NOW

An example of successful VUB PhD-research, on the system level, is the spin-off Softkinetic Sensors. This company, adjacent to VUB, makes sensors that can capture the environment in 3D by using time-of-flight measurements of laser-light. These sensors can be applied to games, devices for gesture recognition, car collision detectors of the future self-driving car, and more.

Major companies like Apple, Intel and Texas Instruments do business with Softkinetic. These novel sensors form the basis for the development of virtual reality goggles and robotic sensors. Several university labs now work with this exciting VUB start-up.

BRIGHT IDEAS

The programme offers students a broad selection of research subjects backed by a large number of research entities, ranging from device physics and sub-systems to complex electronic systems. On the device physics level for example, PhD-students – supported by VUB professors and the research centre IMEC – were the first to improve the brightness of Light Emitting Diodes (LEDs), bringing them from 3% to over 50% efficiency. Thanks to their work, old lamps can now be replaced by LED lamps that give the same brightness for one 10th of the power consumption.



50 students in master year 1



Full English-taught programme



Joint degree from 2 universities

ADMISSION CRITERIA

Admission is based on the review of each application: proof of meeting academic and language requirements, personal motivation, etc.

LANGUAGE REQUIREMENTS

Prospective students can provide proof of sufficient knowledge of English as language of instruction by meeting one of the following criteria:

- having successfully completed one of the following language proficiency tests:
 - TOEFL: minimum level: 213 for the computer-based test (CBT); 72 for the internet-based test (IBT); 550 for paper-based test
 - TOEIC: minimum level: 785
 - IELTS: minimum level academic module 6
 - CAE: minimum grade B
 - CPE: minimum grade C
 - ITACE for Students certificate with ERK/CEFR score B2
 - Cambridge English First (FCE)
 - Cambridge English: Business Vantage (BEC Vantage)
 - Cambridge Michigan ECCE
 - Trinity College London: ISE II, GESE Grade 7-9; or ALTE Q mark
 - The Pearson Test of English General (PTE General): minimum level 3
 - The Pearson Test of English Academic (PTE Academic): minimum level 59

- having successfully completed at least one year of secondary education with English as language of instruction, or having successfully completed secondary school in a Belgian institution;
- having successfully completed programme units in higher education with a minimum of 54 ECTS-credits where English was the language of instruction.

For more details on admission requirements and application: www.bruface.eu

SPECIFIC ADMISSION CRITERIA

Direct enrolment for this study plan is possible if the applicant has obtained a bachelor degree in Engineering or Engineering Technology at VUB. Admission decisions for students from other institutions are based on evaluation of a complete application file. Students with a bachelor in the same field of study have direct access after the evaluation of their application file. Admission for holders of another engineering degree is based on evaluation and approval by the curriculum council.

Application deadline

Prospective students are advised to apply as soon as possible, even if they have not yet obtained their degree. Applications need to be submitted only through our website www.bruface.eu

- Students who require a visa (non-EU/EEA nationals) need to submit their pre-application before March 24th
- Students who do not require a visa must submit their pre-application before September 12th
- Note: if the proof of English proficiency or APS certificate is not ready before the deadline, you can always submit it later instead of missing the deadline

Tuition fees

Students pay the tuition fee at the institution at which they enrol, in agreement with the institution's legal requirements. The tuition fee for the non-EU students is recalculated yearly and jointly by both institutions, taking into account the legislation in both regions. Indication of tuition fee: 800 - 3000 euro per year. A detailed overview of the tuition fees can be found on www.bruface.eu

Contact

www.bruface.eu
www.vub.ac.be/architectural-engineering