Master of Science in

Electronics and Information Technology Engineering

Bruface

Brussels Faculty of Engineering, BRUFACE is a joint initiative of the two universities in the center of Brussels. The Université Libre de Bruxelles and the Vrije Universiteit Brussel jointly offer an English taught Master of Science program in Electronics and Information Technology Engineering.

Objectives

This course has as general aim to form competent engineers who can contribute to our society, on all levels and in different fields of application.

General competences at an advanced level

- A broad scientific and profound practical knowledge of technology, with attention to the social, moral, juridical, economical and environmental aspects of their activities.
- The students are ready for an international career with English as working language.
- They are prepared to take responsibilities, can withstand stress, can act individually but can also function in a group.
- They are intellectually mobile and curious, they can act upon necessary evolutions, they are prepared for life-long learning, especially in their own field of specialization.

Scientific knowledge in their own field

The course aims at forming engineers adapted to the actual needs of our society. They have also a broad overview of the impact of electronics and informatics on industry, on economics and on the world-wide trade and commerce.
Because the students were already involved in an actual research project during their master thesis work, they have already some experience in conducting research, and can consequently contribute to technological and/or scientific innovations.

They have a profound and active knowledge of the theory and applications of electronics and information technology, starting from the component up to the system level. This is because the students have learned, during their studies, to specify, design and evaluate individual components as well as complex systems.

Moreover, they have acquired during their studies:

- a profound knowledge of electronic circuits and systems knowledge of tele-communications and computer-controlled systems
- basic knowledge of information theory, treatment of signals and images, multimedia and photonics
- a profound knowledge of modeling, system-identification, electric and electronic measurements and industrial control
- some basic knowledge of economics and management informatics and software engineering

The students have to specialize in one of the above mentioned topics by choosing a coherent package of optional course units. Moreover, they have also the possibility to broaden their view by choosing free optional course units.

With their master thesis they have shown to be able to solve autonomously a specific scientific-technical problem.

More information available on www.bruface.eu

Vrije Universiteit Brussel

UNIVERSITÉ LIBRE DE BRUXELLES, UNIVERSITÉ D'EUROPE ULB

Master of Science in

Electronics and Information Technology Engineering

Option

Measuring, Modeling and Simulating

First Master Year

Measurement and Identification	compulsory	1st semester	7 study points
Design and Implementation of Digital Circuits	compulsory	1st semester	3 study points
Signal Theory	compulsory	1st semester	5 study points
Digital Signal Processing	compulsory	1st semester	7 study points
Electronic Devices 2	compulsory	1st semester	3 study points
Photonics	compulsory	1st semester	4 study points
Integrated Electronic Systems	compulsory	2nd semester	3 study points
Sensors and Microsystem Electronics	compulsory	2nd semester	6 study points
High-frequency Electronics and Antennes	compulsory	2nd semester	6 study points
Image Processing	compulsory	2nd semester	3 study points
Pattern Recognition	compulsory	2nd semester	3 study points
Software Engineering	compulsory	2nd semester	4 study points
Analog Electronics	compulsory	annual course unit	6 study points

Second Master Year

Business Information Systems	compulsory	1st semester	3 study points
Master Thesis Electronics and IT-Engineering	compulsory	annual course unit	24 study points

Option Measuring, modelling and simulating: 20 credits from this list and 4 credits free electives

CAE-tools for the Design of Analog Electronic Circuits	optional	1st semester	4 study points
Design and Characterisation of RF and Microwave Nonlinear Systems	optional	1st semester	4 study points
Identification of Dynamical Systems	optional	1st semester	4 study points
Industrial Measurement Environments	optional	1st semester	4 study points
Measuring and Modelling of Nonlinear Systems	optional	1st semester	4 study points
Bioinformatics and Datamining	optional	annual course unit	4 study points
Advanced Control Techniques	optional	annual course unit	4 study points

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Vrije Universiteit Brussel

UNIVERSITÉ LIBRE DE BRUXELLES, UNIVERSITÉ D'EUROPE ULB

Master of Science in

Electronics and Information Technology Engineering

Option
Multimedia

First Master Year

Measurement and Identification	compulsory	1st semester	7 study points
Design and Implementation of Digital Circuits	compulsory	1st semester	3 study points
Signal Theory	compulsory	1st semester	5 study points
Digital Signal Processing	compulsory	1st semester	7 study points
Electronic Devices 2	compulsory	1st semester	3 study points
Photonics	compulsory	1st semester	4 study points
Integrated Electronic Systems	compulsory	2nd semester	3 study points
Sensors and Microsystem Electronics	compulsory	2nd semester	6 study points
High-frequency Electronics and Antennes	compulsory	2nd semester	6 study points
Image Processing	compulsory	2nd semester	3 study points
Pattern Recognition	compulsory	2nd semester	3 study points
Software Engineering	compulsory	2nd semester	4 study points
Analog Electronics	compulsory	annual course unit	6 study points

Second Master Year

Business Information Systems	compulsory	1st semester	3 study points
Master Thesis Electronics and IT-Engineering	compulsory	annual course unit	24 study points

Option Multimedia: 21 credits compulsory courses

Image and Video Technology	optional	1st semester	5 study points
Computer Graphics & Computer Vision	optional	1st semester	6 study points
Digital Speech and Audio Processing	optional	1st semester	6 study points
Physical Communication	optional	1st semester	4 study points

Option Multimedia: 3 credits form this list

Digital Video Broadcasting	optional	1st semester	3 study points
Spectrum Estimation Methods	optional	1st semester	3 study points
Telecommunication Networks	optional	1st semester	3 study points
Seminar Multimedia	optional	1st semester	3 study points
Capita Selecta Multimedia	optional	2nd semester	3 study points
Distributed Systems	optional	2nd semester	6 study points
Bioinformatics and Datamining	optional	annual course unit	4 study points

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Vrije Universiteit Brussel

UNIVERSITÉ LIBRE DE BRUXELLES, UNIVERSITÉ D'EUROPE ULB

Master of Science in

Electronics and Information Technology Engineering

Option
Telecom

First Master Year

Measurement and Identification	compulsory	1st semester	7 study points
Design and Implementation of Digital Circuits	compulsory	1st semester	3 study points
Signal Theory	compulsory	1st semester	5 study points
Digital Signal Processing	compulsory	1st semester	7 study points
Electronic Devices 2	compulsory	1st semester	3 study points
Photonics	compulsory	1st semester	4 study points
Integrated Electronic Systems	compulsory	2nd semester	3 study points
Sensors and Microsystem Electronics	compulsory	2nd semester	6 study points
High-frequency Electronics and Antennes	compulsory	2nd semester	6 study points
Image Processing	compulsory	2nd semester	3 study points
Pattern Recognition	compulsory	2nd semester	3 study points
Software Engineering	compulsory	2nd semester	4 study points
Analog Electronics	compulsory	annual course unit	6 study points

Second Master Year

Business Information Systems	compulsory	1st semester	3 study points
Master Thesis Electronics and IT-Engineering	compulsory	annual course unit	24 study points

Option Telecom: 3 credits compulsory course

Telecommunication Networks	optional	1st semester	3 study points

Option Telecom: 21 credits from this list

Communication Protocols	optional	1st semester	4 study points
Operating Systems and Security	optional	1st semester	6 study points
Voice, Image Coding, Media and Systems	optional	1st semester	6 study points
Physical Communication	optional	1st semester	4 study points
Seminar Telecom	optional	1st semester	3 study points
Capita Selecta Telecom	optional	2nd semester	3 study points
Cryptography	optional	2nd semester	3 study points
Digital Techniques in Telephony	optional	2nd semester	3 study points
Distributed Systems	optional	2nd semester	6 study points

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Vrije Universiteit Brussel

UNIVERSITÉ LIBRE DE BRUXELLES, UNIVERSITÉ D'EUROPE ULB

Master of Science in

Electronics and Information Technology Engineering

Option
Informatics

First Master Year

Measurement and Identification	compulsory	1st semester	7 study points
Design and Implementation of Digital Circuits	compulsory	1st semester	3 study points
Signal Theory	compulsory	1st semester	5 study points
Digital Signal Processing	compulsory	1st semester	7 study points
Electronic Devices 2	compulsory	1st semester	3 study points
Photonics	compulsory	1st semester	4 study points
Integrated Electronic Systems	compulsory	2nd semester	3 study points
Sensors and Microsystem Electronics	compulsory	2nd semester	6 study points
High-frequency Electronics and Antennes	compulsory	2nd semester	6 study points
Image Processing	compulsory	2nd semester	3 study points
Pattern Recognition	compulsory	2nd semester	3 study points
Software Engineering	compulsory	2nd semester	4 study points
Analog Electronics	compulsory	annual course unit	6 study points

Second Master Year

Business Information Systems	compulsory	1st semester	3 study points
Master Thesis Electronics and IT-Engineering	compulsory	annual course unit	24 study points

Option Informatics: 24 credits from this list

Image and Video Technology	optional	1st semester	5 study points
Communication Protocols	optional	1st semester	4 study points
Computer Graphics & Computer Vision	optional	1st semester	6 study points
Advanced Computer Architecture	optional	1st semester	3 study points
Java Programming	optional	1st semester	6 study points
Operating Systems and Security	optional	1st semester	6 study points
Software for Embedded Systems	optional	1st semester	3 study points
Techniques of Artificial Intelligence	optional	1st semester	6 study points
Compilers	optional	2nd semester	6 study points
Cryptography	optional	2nd semester	3 study points
Databases	optional	2nd semester	4 study points
Project Computer Engineering	optional	2nd semester	3 study points
Distributed Systems	optional	2nd semester	6 study points
Bioinformatics and Datamining	optional	annual course unit	4 study points
Code Generation for Embedded Systems	optional	annual course unit	3 study points
Multiprocessors and Reconfigurable Architectures	optional	annual course unit	3 study points
Project Embedded Systems	optional	annual course unit	6 study points

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Vrije Universiteit Brussel

UNIVERSITÉ LIBRE DE BRUXELLES, UNIVERSITÉ D'EUROPE ULB

Master of Science in

Electronics and Information Technology Engineering

Option
Photonics

First Master Year

Measurement and Identification	compulsory	1st semester	7 study points
Design and Implementation of Digital Circuits	compulsory	1st semester	3 study points
Signal Theory	compulsory	1st semester	5 study points
Digital Signal Processing	compulsory	1st semester	7 study points
Electronic Devices 2	compulsory	1st semester	3 study points
Photonics	compulsory	1st semester	4 study points
Integrated Electronic Systems	compulsory	2nd semester	3 study points
Sensors and Microsystem Electronics	compulsory	2nd semester	6 study points
High-frequency Electronics and Antennes	compulsory	2nd semester	6 study points
Image Processing	compulsory	2nd semester	3 study points
Pattern Recognition	compulsory	2nd semester	3 study points
Software Engineering	compulsory	2nd semester	4 study points
Analog Electronics	compulsory	annual course unit	6 study points

Second Master Year

Business Information Systems	compulsory	1st semester	3 study points
Master Thesis Electronics and IT-Engineering	compulsory	annual course unit	24 study points

Option Photonics: 24 credits from this list

Lasers	optional	1st semester	4 study points
Microphotonics	optional	1st semester	6 study points
Optical Materials	optional	1st semester	6 study points
Advanced Photonics Laboratory	optional	2nd semester	4 study points
Design of Refractive and Diffractive Optical Systems	optional	2nd semester	4 study points
Optical Communication Systems	optional	2nd semester	6 study points
Photonics Laboratory	optional	2nd semester	4 study points
Photonic Semiconductor Devices and Technology	optional	annual course unit	4 study points

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