Master of science in Electrical Engineering
Focus electronics and information technologies

The Master is defined around 4 axes:

> Electronics and microelectronics
> Telecommunication
> Multimedia
> Automatic control

Bloc 1 | M-IRELE | MA-IREL

Compulsory courses

ELEC-H401   **Modulation and coding** | Francois HORLIN (Coordinator)
⏱ 5 credits [lecture: 36h, practical work: 24h]   📅 second term   💬 English

ELEC-H409   **Digital architectures and design** | Dragomir MILOJEVIC (Coordinator)
⏱ 4 credits [lecture: 12h, practical work: 36h]   📅 first term   💬 English

ELEC-H415   **Communication channels** | Philippe DE DONCKER (Coordinator)
⏱ 5 credits [lecture: 24h, tutorial classes: 36h, project: 12h]   📅 second term   💬 English

ELEC-H417   **Communication networks : protocols and architectures** | Jean-Michel DRICOT (Coordinator)
⏱ 5 credits [lecture: 36h, practical work: 24h]   📅 first term   💬 English

ELEC-H473   **Microprocessor architecture** | Dragomir MILOJEVIC (Coordinator)
⏱ 5 credits [lecture: 24h, practical work: 36h]   📅 second term   💬 English

ELEC-Y400   **Analog electronics** | Piet WAMBACQ (Coordinator)
⏱ 5 credits [lecture: 36h, tutorial classes: 24h]   📅 first term   💬 English

ELEC-Y412   **Image processing** | Adrian MUNTEANU (Coordinator)
⏱ 5 credits [lecture: 24h, tutorial classes: 18h, practical work: 30h]   📅 second term   💬 English

ELEC-Y413   **Signal theory** | Gert VANDERSTEEN (Coordinator)
⏱ 4 credits [lecture: 36h]   📅 first term   💬 English

ELEC-Y418   **Sensors and Microsystem electronics** | Maarten Kuijk (Coordinator)
⏱ 5 credits [lecture: 30h, tutorial classes: 30h]   📅 second term   💬 English

ELEC-Y430   **Digital signal processing** | Nicolaos DELIGIANNIS (Coordinator)
⏱ 4 credits [lecture: 24h, practical work: 24h]   📅 first term   💬 English

ELEC-Y503   **Measurement and Data Driven Modelling** | John LATAIRE (Coordinator)
⏱ 4 credits [lecture: 24h, practical work: 24h]   📅 second term   💬 English

MATH-H407   **Control system design** | Emanuele GARONE (Coordinator)
⏱ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h]   📅 first term   💬 English

One course chosen from the following

ELEC-Y404
(optional)   **Operating systems and security** | Bruno Tiago DA SILVA GOMES (Coordinator)
⏱ 4 credits [lecture: 12h, project: 90h]   📅 first term   💬 English

PROJ-H415
(optional)   **Project Electronics and Telecommunication** | Francois HORLIN (Coordinator)
⏱ 4 credits [project: 96h]   📅 academic year   💬 English
A choisir parmi :
> Projet scientifique
> Chef d'équipe
> CODEPO
> ECO Marathon
> Plydaire

Master of science in Electrical Engineering
Focus electronics and information technologies

Bloc 2 | M-IRELE | MA-IREL

Master Thesis (compulsory)

Master thesis

MEMO-H503   **Master thesis in Electrical Engineering** | Philippe DE DONCKER (Coordinator) and Roger VOUNCKX
🕐 24 credits [mfe/tfe: 600h]   📅 academic year   💬 English

Options - Block 2

An alternative chosen from the three following

Option nano, opto-electronics and embedded systems

ELEC-H505
(optional)

Advanced digital architecture | Dragomir MILOJEVIC (Coordinator)
🕐 5 credits [lecture: 24h, practical work: 36h]   📅 second term   💬 English

ELEC-Y411
(optional)

High-frequency Electronics and Antenna | Yves ROLAIN (Coordinator)
🕐 5 credits [lecture: 24h, tutorial classes: 18h, project: 36h]   📅 first term   💬 English

ELEC-Y415
(optional)

Software and engineering for embedded systems | Bruno Tiago DA SILVA GOMES (Coordinator)
🕐 5 credits [lecture: 20h, tutorial classes: 10h, project: 60h]   📅 second term   💬 English

ELEC-Y515
(optional)

Nano-Electronics Devices & Technologies | Bertrand Parvais (Coordinator)
🕐 5 credits [lecture: 30h, practical work: 30h]   📅 first term   💬 English

ELEC-Y548
(optional)

Photonics | Francis BERGHMANS (Coordinator), Roland Baets, Gunther Roelkens and Hugo THIENPONT
🕐 4 credits [lecture: 36h]   📅 first term   💬 English

or

Option information and communication technology systems

ELEC-H422
(optional)

Wireless communication channels | Philippe DE DONCKER (Coordinator)
🕐 4 credits [lecture: 24h, practical work: 24h]   📅 second term   💬 English

ELEC-H423
(optional)

Mobile and wireless networks | Jean-Michel DRICOT (Coordinator)
🕐 4 credits [lecture: 24h, practical work: 24h]   📅 first term   💬 English

ELEC-H522
(optional)

Digital communications | Francois HORLIN (Coordinator)
🕐 4 credits [lecture: 24h, practical work: 24h]   📅 second term   💬 English

ELEC-Y512
(optional)

Computer vision | HICHEM SAHLI (Coordinator)
🕐 4 credits [lecture: 18h, tutorial classes: 12h, project: 36h]   📅 first term   💬 English

ELEC-Y591
(optional)

Machine Learning and Big Data Processing | Nicolaos DELIGIANNIS (Coordinator) and Adrian MUNTEANU
🕐 5 credits [lecture: 24h, tutorial classes: 18h, project: 30h]   📅 second term   💬 English

INFO-Y093
(optional)

Image and video technology | Peter SCHELKENS (Coordinator)
🕐 3 credits [lecture: 15h, tutorial classes: 30h]   📅 first term   💬 English

or

Option measuring, modeling and control

ELEC-H509
(optional)

Optimization-based Control Design | Emanuele GARONE (Coordinator)
🕐 4 credits [lecture: 24h, practical work: 24h]   📅 first term   💬 English

ELEC-Y416
(optional)

Advanced Measurement and Data Driven Modeling | John LATAIRE (Coordinator)
🕐 4 credits [lecture: 24h, tutorial classes: 24h]   📅 first term   💬 English

ELEC-Y417
(optional)

Selected Topics in Nonlinear System Identification | Yves ROLAIN (Coordinator) and Dries PEUMANS
🕐 3 credits [lecture: 18h, project: 42h]   📅 first term   💬 English

ELEC-Y513
(optional)

Identification of dynamical systems | John LATAIRE (Coordinator)
🕐 5 credits [lecture: 18h, tutorial classes: 30h, project: 30h]   📅 first term   💬 English

ELEC-Y591
(optional)

Machine Learning and Big Data Processing | Nicolaos DELIGIANNIS (Coordinator) and Adrian MUNTEANU
🕐 5 credits [lecture: 24h, tutorial classes: 18h, project: 30h]   📅 second term   💬 English

MATH-H503
(optional)

Model-Based and Data-Driven Fault Detection and Isolation | Michel KINNAERT (Coordinator)
🕐 3 credits [lecture: 18h, practical work: 18h]   📅 second term   💬 English

Electives MA2 including optional internships

A total of 12 credits chosen from the following

ELEC-H503
(optional)

Artificial organs | Antoine NONCLERCQ (Coordinator)
🕐 5 credits [lecture: 24h, practical work: 36h]   📅 second term   💬 English

ELEC-H504
(optional)

Network Security | Jean-Michel DRICOT (Coordinator)
🕐 3 credits [lecture: 24h, practical work: 12h]   📅 second term   💬 English

ELEC-H507
(optional)

Photonic communication systems | Simon-Pierre GORZA (Coordinator)
🕐 5 credits [lecture: 36h, tutorial classes: 24h]   📅 first term   💬 English

ELEC-H550
(optional)

Embedded System Security | Jan Tobias Mühlberg (Coordinator)
🕐 5 credits [lecture: 24h, practical work: 36h]   📅 first term   💬 English

ELEC-Y516
(optional)

Lasers | Guy VERSCHAFFELT (Coordinator), Geert Morthier and Nathalie VERMEULEN
🕐 4 credits [lecture: 36h, tutorial classes: 12h]   📅 first term   💬 English

ELEC-Y521
(optional)

Laboratories in Photonics Research | Heidi OTTEVAERE (Coordinator), Nicolas Le Thomas and Wendy Meulebrouck
🕐 6 credits [lecture: 8h, tutorial classes: 88h]   📅 second term   💬 English

ELEC-Y531
(optional)

Physical Communication | Dries PEUMANS (Coordinator)
🕐 6 credits [lecture: 30h, practical work: 60h]   📅 first term   💬 English

ELEC-Y532
(optional)

Telecommunication Networks | Marnix GOOSSENS (Coordinator)
🕐 3 credits [lecture: 24h]   📅 first term   💬 English

ELEC-Y535
(optional)

Capita Selecta Telecom | Gert VANDERSTEEN (Coordinator) and Dries PEUMANS
🕐 3 credits [lecture: 24h]   📅 second term   💬 English

ELEC-Y540
(optional)

Project Computer Engineering | Bart JANSEN (Coordinator)
🕐 3 credits [practical work: 36h]   📅 second term   💬 English

ELEC-Y541
(optional)

Multiprocessors and Reconfigurable Architectures | Abdellah TOUHAFI (Coordinator) and Bruno Tiago DA SILVA GOMES
🕐 3 credits [lecture: 18h, practical work: 18h]   📅 academic year   💬 English

ELEC-Y542
(optional)

CAE-tools for the Design of Analog Electronic Circuits | Gert VANDERSTEEN (Coordinator)
🕐 3 credits [lecture: 12h, practical work: 30h]   📅 first term   💬 English

ELEC-Y543
(optional)

Industrial Measurement Environments | Yves ROLAIN (Coordinator)
4 credits [lecture: 30h, practical work: 12h]   first term   English

ELEC-Y546
(optional)

Cryptography | Ann DOOMS (Coordinator)
3 credits [lecture: 18h, tutorial classes: 24h]   second term   English

GEST-S421
(optional)

Entrepreneurial ecosystems | Judith BEHRENS (Coordinator)
5 credits [lecture: 24h, tutorial classes: 24h]   second term   English

GEST-Y500
(optional)

Entrepreneurship | Nikolay DENTCHEV (Coordinator)
3 credits [lecture: 15h, tutorial classes: 9h, personal assignments: 62h]   first term   English

INFO-H422
(optional)

Theory of information coding computing and complexity | Nicolas CERF (Coordinator) and Jérémie ROLAND
5 credits [lecture: 48h, tutorial classes: 12h]   second term   English

INFO-H501
(optional)

Pattern recognition and image analysis | Olivier DEBEIR (Coordinator) and Christine DECAESTECKER
5 credits [lecture: 36h, practical work: 24h]   second term   English

INFO-H502
(optional)

Virtual Reality | Gauthier LAFRUIT (Coordinator)
5 credits [lecture: 24h, practical work: 24h, project: 12h]   first term   English

INFO-Y095
(optional)

Voice, image coding, media and systems | Gert VANDERSTEEN (Coordinator) and Leo VAN BIESEN
6 credits [lecture: 42h, tutorial classes: 18h]   first term   English

INFO-Y098
(optional)

Capita selecta multimedia | Colas SCHRETTER (Coordinator)
3 credits [lecture: 24h]   second term   English

INFO-Y575
(optional)

Cloud Artifcial Intelligence Services | Gert VANDERSTEEN (Coordinator) and Lesley De Cruz
3 credits [lecture: 8h, tutorial classes: 20h, project: 30h]   first and second terms   English

INFO-Y576
(optional)

Cloud Machine Learning | Gert VANDERSTEEN (Coordinator) and Lesley De Cruz
3 credits [lecture: 8h, tutorial classes: 30h, project: 30h]   first and second terms   English

MECA-Y502
(optional)

Theory and Practice of Advanced Control | Emanuele GARONE (Coordinator) and Michel KINNAERT
4 credits [lecture: 24h, practical work: 24h]   second term   English

PHYS-Y016
(optional)

Optical materials | Jan DANCKAERT (Coordinator), Kristiaan Neyts and Guy VERSCHAFFELT
6 credits [lecture: 30h, tutorial classes: 30h]   first term   English

STAG-H501
(optional)

Internship (60 days) | Frédéric ROBERT (Coordinator)
10 credits [personal assignments: 300h]   first term   English

STAG-H502
(optional)

Internship (2 months) | Lincy Pyl (Coordinator)
6 credits [personal assignments: 180h]   first term   English

Modules transversaux

Students have also the opportunity to choose courses among the courses of the 'transversal modules' of the School.

English : LANG-H500

Engineering and society : PROJ-H421 - GEST-H509 - BIME-G5505 – PHYS-F517

Sustainability : GEST-S492 - ENVI-F405 - CHIM-H504 - ENVI-F452 - ENVI-F454 - ELEC-Y514

Finance, accounting, management, marketing, logistics and quality : GEST-S101 - GEST-S318 - GEST-S421 - GEST-Y501 GEST-H501 - GEST-H502

Participation to a summer school : EDUC-H601

Up to six credits chosen from the following

BIME-G5505
(optional)

Interfaculty and interdisciplinary program in Healthcare Innovation | Hilde STEVENS (Coordinator)
5 credits [lecture: 40h, tutorial classes: 20h]   second term   English

CHIM-H504
(optional)

Engineering aspects of circular economy | Prakash VENKATESAN (Coordinator)
5 credits [lecture: 24h, practical work: 36h]   second term   English

DROI-C5174
(optional)

Approche interdisciplinaire du droit de la propriété intellectuelle/Interdisciplinary Approach to In | Julien CABAY (Coordinator)
5 credits [lecture: 24h]   first term   English/French

EDUC-H601
(optional)

Summer School | Johan GYSELINCK (Coordinator)
🕐 5 credits [personal assignments: 5h]   📅 academic year   💬 English

ELEC-Y514
(optional)

Sustainability : an interdisciplinary Approach | Cathy MACHARIS (Coordinator) and Waldo Galle
🕐 6 credits [lecture: 36h, practical work: 24h]   📅 academic year   💬 English

ENVI-F405
(optional)

Climat: sciences et politiques | Frank PATTYN (Coordinator) and Louise Knops
🕐 5 credits [lecture: 40h]   📅 second term   💬 French

ENVI-F452
(optional)

Environmental impact analysis and management | Wouter ACHTEN (Coordinator)
🕐 5 credits [lecture: 24h, practical work: 12h, project: 24h]   📅 first term   💬 English/French

ENVI-F454
(optional)

Energie: Société et environnement | Michel HUART (Coordinator) and Nadine MATTIELLI
🕐 5 credits [lecture: 30h, practical work: 12h, project: 24h]   📅 first term   💬 French

GEST-H501
(optional)

Logistics Engineering and Management | Alassane Ballé NDIAYE (Coordinator)
🕐 5 credits [lecture: 12h, tutorial classes: 36h]   📅 first term   💬 English

GEST-H502
(optional)

Supply Chain Performance Analytics | Alassane Ballé NDIAYE (Coordinator)
🕐 5 credits [lecture: 12h, tutorial classes: 36h, personal assignments: 12h]   📅 second term   💬 English

GEST-S101
(optional)

Comptabilité financière | Gilles GEVERS (Coordinator) and Laurent GHEERAERT
🕐 5 credits [lecture: 36h, tutorial classes: 8h]   📅 second term   💬 French

GEST-S318
(optional)

Introduction to theoretical finance | Laurent GHEERAERT (Coordinator)
🕐 5 credits [lecture: 24h, tutorial classes: 24h]   📅 second term   💬 English

GEST-S421
(optional)

Entrepreneurial ecosystems | Judith BEHRENS (Coordinator)
🕐 5 credits [lecture: 24h, tutorial classes: 24h]   📅 second term   💬 English

GEST-S492
(optional)

Energy policy, sustainability & management | Adel EL Gammal (Coordinator), Julien BLONDEAU and Michel HUART
🕐 5 credits [lecture: 36h, seminars: 24h]   📅 first term   💬 English

GEST-Y501
(optional)

Business Management and Entrepreneurship | Marc GOLDCHSTEIN (Coordinator)
🕐 3 credits [lecture: 33h]   📅 first term   💬 English

LANG-H500
(optional)

English for professional purposes | Alexander CORNFORD (Coordinator) and Matthew LANGSLEY
🕐 5 credits [tutorial classes: 48h, personal assignments: 12h]   📅 first and second terms   💬 English

PHYS-F517
(optional)

How To Make (almost) Any Experiment Using Digital Fabrication | Denis TERWAGNE (Coordinator)
🕐 5 credits [lecture: 24h, practical work: 24h]   📅 first term   💬 French

PROJ-H421
(optional)

Projet polydaire: expériences didactiques innovantes pour le secondaire | Simon-Pierre GORZA (Coordinator)
🕐 5 credits [project: 150h]   📅 academic year   💬 French