

# Master of science in Electromechanical Engineering

Focus Operations engineering and management

## Bloc 1 | M-IREMI | MA-IREM

### Common courses - Block 1

- ELEC-H406** | **Electrical drives** | Johan GYSELINCK (Coordinator) and Omar HEGAZY  
 5 credits [lecture: 24h, practical work: 36h] | second term | English
- MATH-H407** | **Control system design** | Emanuele GARONE (Coordinator)  
 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] | first term | English
- MECA-H402** | **Turbomachinery** | Patrick HENDRICK (Coordinator)  
 3 credits [lecture: 24h, tutorial classes: 12h] | second term | English
- MECA-H409** | **Design methodology** | Alain DELCHAMBRE (Coordinator)  
 5 credits [lecture: 24h, tutorial classes: 24h, personal assignments: 12h] | first term | English
- MECA-H419** | **Data-Driven Engineering** | Alessandro PARENTE (Coordinator), Axel Coussement, Emanuele GARONE, Omar HEGAZY, Alassane Ballé NDIAYE and Mehrdad TERATANI  
 4 credits [lecture: 36h, tutorial classes: 12h] | second term | English

### Partially common courses - Block 1

#### Courses to choose

- CNST-H421** | **Structural analysis and finite elements** | Peter BERKE (Coordinator) and Lincy Pyl  
 5 credits [lecture: 36h, tutorial classes: 24h] | first term | English
- MECA-H411** | **Mechanical Vibrations** | Arnaud DERAEMAERKER (Coordinator) and Wout Weijtjens  
 5 credits [lecture: 36h, tutorial classes: 24h] | first term | English
- MECA-H420** | **Piston Engines** | Axel Coussement (Coordinator)  
 3 credits [lecture: 26h, practical work: 8h] | first term | English

#### Optional courses

*One course chosen from the following*

- PROJ-H405** (optional) | **Project in Electromechanical Engineering** | Emanuele GARONE (Coordinator), Aurélie Bellemans, Svend Bram, Alain DELCHAMBRE, Johan GYSELINCK, Patrick HENDRICK, Pierre HENNEAUX, Joeri VAN MIERLO and Bram VANDERBORGHT  
 5 credits [personal assignments: 150h] | first and second terms | English
- PROJ-H417** (optional) | **Projet coopération au développement / Development cooperation project** | Antoine NONCLERCQ (Coordinator)  
 5 credits [project: 150h] | first and second terms | French  
 Only on selection : see the Development Unit of the Polytechnic School of Brussels (<http://polytech.ulb.be/en/international/development-cooperation>)
- PROJ-H418** (optional) | **Hands-on learning: project manager (chef de projet)** | Peter BERKE (Coordinator)  
 5 credits [project: 150h] | first and second terms | French
- PROJ-H420** (optional) | **Eco-marathon project** | Patrick HENDRICK (Coordinator) and Johan GYSELINCK  
 5 credits [project: 150h] | first and second terms | English

### Specific courses - Block 1

- GEST-H501** | **Logistics Engineering and Management** | Alassane Ballé NDIAYE (Coordinator)  
 5 credits [lecture: 12h, tutorial classes: 36h] | first term | English

- GEST-H502 [Supply Chain Performance Analytics](#) | Alassane Ballé NDIAYE (Coordinator)  
🕒 5 credits [lecture: 12h, tutorial classes: 36h, personal assignments: 12h] 📅 second term 🗨 English
- INFO-H420 [Management of Data Science and Business Workflows](#) | Dimitrios SACHARIDIS (Coordinator)  
🕒 5 credits [lecture: 24h, tutorial classes: 36h] 📅 first term 🗨 English
- STAT-S406 [Data management and business analytics](#) | Martine GEORGE (Coordinator)  
🕒 5 credits [lecture: 36h, tutorial classes: 24h] 📅 second term 🗨 English









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## Bloc 2 | M-IREMI | MA-IREM

### Partially common courses - Block 2

#### Courses to choose

- MATH-H503 **Model-Based and Data-Driven Fault Detection and Isolation** | Michel KINNAERT (Coordinator)  
 4 credits [lecture: 24h, practical work: 24h]  second term  English
- MECA-H406 **Composite structures** | Patrick HENDRICK (Coordinator)  
 3 credits [lecture: 18h, tutorial classes: 18h]  second term  English
- PHYS-H524 **Reliability and risk analysis of industrial installations** | Pierre-Etienne LABEAU (Coordinator)  
 4 credits [lecture: 24h, tutorial classes: 18h, practical work: 6h]  first term  English





### Master Thesis

- MEMO-H502 **Master thesis in Electromechanical Engineering** | Patrick HENDRICK (Coordinator), Aurélie Bellemans, Svend Bram, Alain DELCHAMBRE, Emanuele GARONE, Johan GYSELINCK, Pierre HENNEAUX, Joeri VAN MIERLO and Bram VANDERBORGHT  
 24 credits [mfe/tfe: 600h]  academic year  English

### Specific courses - Block 2

#### 10 ECTS







*A total of ten credits chosen from the following*

- GEST-S421 (optional) **Entrepreneurial ecosystems** | Judith BEHRENS (Coordinator)  
 5 credits [lecture: 24h, tutorial classes: 24h]  second term  English
- GEST-S564 (optional) **Project management** | FREDERIC HOFFMANN (Coordinator)  
 5 credits [seminars: 24h]  second term  English

### Elective courses - Block 2

#### Elective courses - Block 2

*A total of 15 credits chosen from the following*

- GEST-H506 (optional) **Energy policy and management** | Pierre HENNEAUX (Coordinator), Adel EL Gammal and Benjamin GENET  
 5 credits [lecture: 42h, practical work: 18h]  first and second terms  English
- GEST-S440 (optional) **Applied marketing analytics** | Sandra ROTHENBERGER (Coordinator) and Philippe MAUCHARD  
 5 credits [lecture: 48h]  second term  English
- GEST-S448 (optional) **Organizational behaviour and leadership** | Claudia TOMA (Coordinator)  
 5 credits [lecture: 24h, tutorial classes: 24h]  first term  English

GEST-S471 (optional)	<b>Management and sustainable development : constraints and opportunities</b>   Eric MONAMI (Coordinator) ⌚ 5 credits [lecture: 36h, seminars: 36h] 📅 second term 🗨 English
INFO-F422 (optional)	<b>Statistical foundations of machine learning</b>   Gianluca BONTEMPI (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 12h, project: 60h] 📅 second term 🗨 English
MATH-H510 (optional)	<b>Risk-based methodologies for energy systems</b>   Pierre-Etienne LABEAU (Coordinator) and Pierre HENNEAUX ⌚ 4 credits [lecture: 24h, personal assignments: 24h] 📅 second term 🗨 English
STAG-H501 (optional)	<b>Internship (60 days)</b>   Frédéric ROBERT (Coordinator) ⌚ 10 credits [personal assignments: 300h] 📅 first term 🗨 English

## Free elective courses

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

## Free elective courses

*Up to six credits chosen from the following*

BIME-G5505 (optional)	<b>Interfaculty and interdisciplinary program in Healthcare Innovation</b>   Hilde STEVENS (Coordinator) ⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 second term 🗨 English
CHIM-H504 (optional)	<b>Engineering aspects of circular economy</b>   Prakash VENKATESAN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English
DROI-C5174 (optional)	<b>Approche interdisciplinaire du droit de la propriété intellectuelle/Interdisciplinary Approach to In</b>   Julien CABAY (Coordinator) ⌚ 5 credits [lecture: 24h] 📅 first term 🗨 English/French
EDUC-H601 (optional)	<b>Summer School</b>   Johan GYSELINCK (Coordinator) ⌚ 5 credits [personal assignments: 5h] 📅 academic year 🗨 English
ELEC-Y514 (optional)	<b>Sustainability : an interdisciplinary Approach</b>   Cathy MACHARIS (Coordinator) and Waldo Galle ⌚ 6 credits [lecture: 36h, practical work: 24h, personal assignments: 100h] 📅 academic year 🗨 English
ENVI-F405 (optional)	<b>Climat: sciences et politiques</b>   Frank PATTYN (Coordinator) and Louise Knops ⌚ 5 credits [lecture: 40h] 📅 second term 🗨 French
ENVI-F452 (optional)	<b>Environmental impact analysis and management</b>   Wouter ACHTEN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 12h, project: 24h] 📅 first term 🗨 English/French
ENVI-F454 (optional)	<b>Energie: Société et environnement</b>   Michel HUART (Coordinator) and Nadine MATTIELLI ⌚ 5 credits [lecture: 30h, practical work: 12h, project: 24h] 📅 first term 🗨 French
GEST-H501 (optional)	<b>Logistics Engineering and Management</b>   Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h] 📅 first term 🗨 English
GEST-H502 (optional)	<b>Supply Chain Performance Analytics</b>   Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h, personal assignments: 12h] 📅 second term 🗨 English
GEST-H509 (optional)	<b>Ethique de l'ingénieur</b> ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗨 French
GEST-S101 (optional)	<b>Comptabilité financière</b>   Laurent GHEERAERT (Coordinator) and Gilles GEVERS ⌚ 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)  
⌚ 5 credits [tutorial classes: 48h, personal assignments: 12h] 📅 first and second terms 🗨 English
- PROJ-H421  
(optional) **Projet polydaire: expériences didactiques innovantes pour le secondaire** | Simon-Pierre GORZA (Coordinator)  
⌚ 5 credits [project: 150h] 📅 academic year 🗨 French