

Master of science in Electromechanical Engineering

Focus Professional

Bloc 1 | M-IREMR | MA-IREM

Projects - Block 1

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](#) | 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

An option chosen from (the same in bloc 1 and bloc 2) :

- M-IREMR-A [Module Aeronautics](#) > *page*
- M-IREMR-E [Module Energy](#) > *page*
- M-IREMR-M [Module Robotics and Mechatronics - Construction](#) > *page*
- M-IREMR-S [Module Sustainable Transport and Automotive Engineering](#) > *page*

Master of science in Electromechanical Engineering

Focus Professional

Bloc 2 | M-IREMR | MA-IREM

Master Thesis - Block 2

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

An option chosen from (the same in bloc 1 and bloc 2):

M-IREMR-A [Module Aeronautics > page](#)

M-IREMR-E [Module Energy > page](#)

M-IREMR-M [Module Robotics and Mechatronics - Construction > page](#)

M-IREMR-S [Module Sustainable Transport and Automotive Engineering > page](#)

Master of science in Electromechanical Engineering

Options | MA-IREM

Module Aeronautics | M-IREMR-A

Bloc 1

Partially common courses - Block 1

- CNST-H421 (option) **Structural analysis and finite elements** | Peter BERKE (Coordinator) and Lincy Pyl
 ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
- MECA-H406 (option) **Composite structures** | Patrick HENDRICK (Coordinator)
 ⌚ 3 credits [lecture: 18h, tutorial classes: 18h] 📅 second term 🗨 English
- MECA-H411 (option) **Mechanical Vibrations** | Arnaud DERAEMAERKER (Coordinator) and Wout Weijtjens
 ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
- MECA-Y401 (option) **Piston engines** | Axel Coussement (Coordinator)
 ⌚ 3 credits [lecture: 26h, practical work: 8h] 📅 first term 🗨 English

Specific courses

- MECA-H407 (option) **Computational Fluid Dynamics I** | Axel Coussement (Coordinator) and Aurélie Bellemans
 ⌚ 5 credits [lecture: 30h, tutorial classes: 6h, practical work: 24h] 📅 second term 🗨 English
- MECA-Y003 (option) **Aircraft structures** | Simon Bergé (Coordinator)
 ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
- MECA-Y402 (option) **Aerodynamics** | Tim De Troyer (Coordinator), Thierry MAGIN and Mark RUNACRES
 ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
- MECA-Y405 (option) **Damage testing in aeronautics** | Dieter De Baere (Coordinator) and Michaël Hinderdael
 ⌚ 3 credits [lecture: 24h, tutorial classes: 12h] 📅 second term 🗨 English
- MECA-Y407 (option) **Technology of the aerospace industry** | Patrick HENDRICK (Coordinator) and Jan BOECKX
 ⌚ 3 credits [lecture: 24h, tutorial classes: 6h, practical work: 6h] 📅 first and second terms 🗨 English

Common courses - Block 1

- MATH-H407 (option) **Control system design** | Emanuele GARONE (Coordinator)
 ⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 first term 🗨 English
- MECA-H402 (option) **Turbomachinery** | Patrick HENDRICK (Coordinator)
 ⌚ 5 credits [lecture: 36h, tutorial classes: 20h, practical work: 4h] 📅 second term 🗨 English
- MECA-H409 (option) **Design methodology** | Alain DELCHAMBRE (Coordinator)
 ⌚ 5 credits [lecture: 24h, tutorial classes: 24h, personal assignments: 12h] 📅 first term 🗨 English
- MECA-H419 (option) **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

Bloc 2

Specific courses - Block 2

- MECA-H506 (option) **Aircraft performance and stability** | Axel Coussement (Coordinator)
 ⌚ 4 credits [lecture: 28h, tutorial classes: 24h] 📅 first term 🗨 English

- MECA-H507 (option) **Aircraft propulsion** | Patrick HENDRICK (Coordinator)
⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
- MECA-H508 (option) **Aircraft conceptual design** | Patrick HENDRICK (Coordinator)
⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English
- MECA-H522 (option) **Computational fluid dynamics II** | Mark RUNACRES (Coordinator) and Aurélie Bellemans
⌚ 3 credits [lecture: 12h, practical work: 12h, project: 20h] 📅 second term 🗨 English
- MECA-Y408 (option) **Avionics** | Paul Hopff (Coordinator)
⌚ 3 credits [lecture: 30h, practical work: 24h] 📅 second term 🗨 English

Elective Courses

A total of 11 credits chosen from the following

- CNST-H528 (option/optional) **Advanced computational structural mechanics** | Thierry MASSART (Coordinator)
⌚ 4 credits [lecture: 12h, practical work: 36h] 📅 first term 🗨 English
- ELEC-H509 (option/optional) **Optimization-based Control Design** | Emanuele GARONE (Coordinator)
⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 English
- GEST-Y503 (option/optional) **EUTOPIA learning unit : Technological business development project** | Thomas Crispeels (Coordinator)
⌚ 3 credits [tutorial classes: 13h, personal assignments: 71h] 📅 academic year 🗨 English
- MATH-H503 (option/optional) **Model-Based and Data-Driven Fault Detection and Isolation** | Michel KINNAERT (Coordinator)
⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 second term 🗨 English
- MECA-H523 (option/optional) **Helicopters** | Elmar RECKER (Coordinator)
⌚ 3 credits [lecture: 24h, tutorial classes: 12h] 📅 second term 🗨 English
- MECA-Y014 (option/optional) **Aircraft systems** | Tim De Troyer (Coordinator)
⌚ 3 credits [lecture: 24h] 📅 first term 🗨 English
- MECA-Y500 (option/optional) **Experimental fluid mechanics** | Jeroen VAN BEECK (Coordinator) and Tim De Troyer
⌚ 3 credits [lecture: 12h, practical work: 24h] 📅 second term 🗨 English
- MECA-Y501 (option/optional) **Aircraft specification and certification** | Jean-Jacques SPEYER (Coordinator)
⌚ 3 credits [lecture: 18h] 📅 second term 🗨 English
- MECA-Y507 (option/optional) **Wind Turbine Aerodynamics and Design** | Mark RUNACRES (Coordinator)
⌚ 4 credits [lecture: 21h, practical work: 21h] 📅 first term 🗨 English
- STAG-H501 (option/optional) **Internship (60 days)** | Frédéric ROBERT (Coordinator)
⌚ 10 credits [personal assignments: 300h] 📅 first term 🗨 English
- STAG-H502 (option/optional) **Internship (2 months)** | Lincy Pyl (Coordinator)
⌚ 6 credits [personal assignments: 180h] 📅 first term 🗨 English

Common Courses

- ELEC-H406 (option) **Electrical drives** | Johan GYSELINCK (Coordinator) and Omar HEGAZY
⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second 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 (option/optional)	Interfaculty and interdisciplinary program in Healthcare Innovation Hilde STEVENS (Coordinator) ⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 second term 🗨 English
CHIM-H504 (option/optional)	Engineering aspects of circular economy Prakash VENKATESAN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English
DROI-C5174 (option/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 (option/optional)	Summer School Johan GYSELINCK (Coordinator) ⌚ 5 credits [personal assignments: 5h] 📅 academic year 🗨 English
ELEC-Y514 (option/optional)	Sustainability : an interdisciplinary Approach Cathy MACHARIS (Coordinator) and Waldo Galle ⌚ 6 credits [lecture: 36h, practical work: 24h] 📅 academic year 🗨 English
ENVI-F405 (option/optional)	Climat: sciences et politiques Frank PATTYN (Coordinator) and Louise Knops ⌚ 5 credits [lecture: 40h] 📅 second term 🗨 French
ENVI-F452 (option/optional)	Environmental impact analysis and management Wouter ACHTEN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 12h, project: 24h] 📅 first term 🗨 English/French
ENVI-F454 (option/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 (option/optional)	Logistics Engineering and Management Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h] 📅 first term 🗨 English
GEST-H502 (option/optional)	Supply Chain Performance Analytics Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h, personal assignments: 12h] 📅 second term 🗨 English
GEST-H509 (option/optional)	📅 unknown term
GEST-S101 (option/optional)	Comptabilité financière Gilles GEVERS (Coordinator) and Laurent GHEERAERT ⌚ 5 credits [lecture: 36h, tutorial classes: 8h] 📅 second term 🗨 French
GEST-S318 (option/optional)	Introduction to theoretical finance Laurent GHEERAERT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S421 (option/optional)	Entrepreneurial ecosystems Judith BEHRENS (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S492 (option/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 (option/optional)	Business Management and Entrepreneurship Marc GOLDCHSTEIN (Coordinator) ⌚ 3 credits [lecture: 33h] 📅 first term 🗨 English
LANG-H500 (option/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 (option/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 (option/optional)	Projet polydaire: expériences didactiques innovantes pour le secondaire Simon-Pierre GORZA (Coordinator) ⌚ 5 credits [project: 150h] 📅 academic year 🗨 French

Module Energy | M-IREMR-E

Bloc 1

Partially common courses

MECA-Y401 (option) **Piston engines** | Axel Coussement (Coordinator)
⌚ 3 credits [lecture: 26h, practical work: 8h] 📅 first term 🗨 English

MECA-Y404 (option) **Fuel cells and batteries** | Annick HUBIN (Coordinator)
⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 English

Specific courses

ELEC-H413 (option) **Electric Power Systems I** | Pierre HENNEAUX (Coordinator), Rafael FEITO-KICZAK and Jonathan SPROOTEN
⌚ 5 credits [lecture: 30h, practical work: 30h] 📅 first term 🗨 English

ELEC-H419 (option) **Multi-Physics Modelling and Simulation** | Johan GYSELINCK (Coordinator)
⌚ 4 credits [lecture: 12h, practical work: 36h] 📅 first term 🗨 English

ELEC-Y401 (option) **Nuclear energy and reactors** | Peter Baeten (Coordinator)
⌚ 5 credits [lecture: 36h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗨 English

MECA-H417 (option) **Sustainable energy** | Michel HUART (Coordinator) and Julien BLONDEAU
⌚ 3 credits [lecture: 36h] 📅 first term 🗨 English

MECA-H418 (option) **Heat transfer and combustion** | Alessandro PARENTE (Coordinator)
⌚ 4 credits [lecture: 24h, seminars: 24h] 📅 second term 🗨 English

MECA-Y409 (option) **Heating, ventilation and air conditioning** | Svend Bram (Coordinator) and Julien BLONDEAU
⌚ 3 credits [lecture: 12h, practical work: 18h] 📅 second term 🗨 English

Common courses - Block 1

Options 'Energy' and 'Aeronautics' : MECA-H402 - Turbomachinery is a 5 ECTS course.

Options 'Sustainable Transport' and 'Robotics' : MECA-H402 - Turbomachinery is a 3 ECTS course.

ELEC-H406 (option) **Electrical drives** | Johan GYSELINCK (Coordinator) and Omar HEGAZY
⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English

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

MECA-H402 (option) **Turbomachinery** | Patrick HENDRICK (Coordinator)
⌚ 5 credits [lecture: 36h, tutorial classes: 20h, practical work: 4h] 📅 second term 🗨 English

MECA-H409 (option) **Design methodology** | Alain DELCHAMBRE (Coordinator)
⌚ 5 credits [lecture: 24h, tutorial classes: 24h, personal assignments: 12h] 📅 first term 🗨 English

MECA-H419 (option) **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

Bloc 2

Partially common courses - Block 2

PHYS-H514 (option) **Reliability and safety** | Pierre-Etienne LABEAU (Coordinator)
⌚ 3 credits [lecture: 18h, tutorial classes: 18h] 📅 first term 🗨 English

Electives courses

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



A total of 17 credits chosen from the following

ELEC-H412 (option/optional)	Design and control of electrical machines Johan GYSELINCK (Coordinator) ⌚ 3 credits [lecture: 12h, practical work: 24h] 📅 first term 🗨 English
ELEC-H543 (option/optional)	Electric Power Systems II Pierre HENNEAUX (Coordinator) ⌚ 5 credits [lecture: 30h, practical work: 30h] 📅 second term 🗨 English
MATH-H503 (option/optional)	Model-Based and Data-Driven Fault Detection and Isolation Michel KINNAERT (Coordinator) ⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 second term 🗨 English
MATH-H503 (option/optional)	Model-Based and Data-Driven Fault Detection and Isolation Michel KINNAERT (Coordinator) ⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 second term 🗨 English
MATH-H510 (option/optional)	Risk-based methodologies for energy systems Pierre-Etienne LABEAU (Coordinator) and Pierre HENNEAUX ⌚ 4 credits [lecture: 30h, tutorial classes: 18h] 📅 second term 🗨 English
MECA-H532 (option/optional)	Advanced internal combustion engines Axel Coussement (Coordinator) ⌚ 3 credits [lecture: 12h, tutorial classes: 14h, practical work: 16h] 📅 second term 🗨 English
MECA-Y507 (option/optional)	Wind Turbine Aerodynamics and Design Mark RUNACRES (Coordinator) ⌚ 4 credits [lecture: 21h, practical work: 21h] 📅 first term 🗨 English
PHYS-H408 (option/optional)	Operation, control and safety of nuclear systems Pierre-Etienne LABEAU (Coordinator), David FRESON and Arnaud MEERT ⌚ 5 credits [lecture: 36h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗨 English
STAG-H501 (option/optional)	Internship (60 days) Frédéric ROBERT (Coordinator) ⌚ 10 credits [personal assignments: 300h] 📅 first term 🗨 English
STAG-H502 (option/optional)	Internship (2 months) Lincy Pyl (Coordinator) ⌚ 6 credits [personal assignments: 180h] 📅 first term 🗨 English

Free elective courses - Block2

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 (option/optional)	Interfaculty and interdisciplinary program in Healthcare Innovation Hilde STEVENS (Coordinator) ⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 second term 🗨 English
CHIM-H504 (option/optional)	Engineering aspects of circular economy Prakash VENKATESAN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English
DROI-C5174 (option/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 (option/optional)	Summer School Johan GYSELINCK (Coordinator) ⌚ 5 credits [personal assignments: 5h] 📅 academic year 🗨 English
ELEC-Y514 (option/optional)	Sustainability : an interdisciplinary Approach Cathy MACHARIS (Coordinator) and Waldo Galle ⌚ 6 credits [lecture: 36h, practical work: 24h] 📅 academic year 🗨 English



ENVI-F405 (option/optional)	Climat: sciences et politiques Frank PATTYN (Coordinator) and Louise Knops ⌚ 5 credits [lecture: 40h] 📅 second term 🗨️ French
ENVI-F452 (option/optional)	Environmental impact analysis and management Wouter ACHTEN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 12h, project: 24h] 📅 first term 🗨️ English/French
ENVI-F454 (option/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 (option/optional)	Logistics Engineering and Management Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h] 📅 first term 🗨️ English
GEST-H502 (option/optional)	Supply Chain Performance Analytics Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h, personal assignments: 12h] 📅 second term 🗨️ English
GEST-H509 (option/optional)	📅 unknown term
GEST-S101 (option/optional)	Comptabilité financière Gilles GEVERS (Coordinator) and Laurent GHEERAERT ⌚ 5 credits [lecture: 36h, tutorial classes: 8h] 📅 second term 🗨️ French
GEST-S318 (option/optional)	Introduction to theoretical finance Laurent GHEERAERT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ English
GEST-S421 (option/optional)	Entrepreneurial ecosystems Judith BEHRENS (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ English
GEST-S492 (option/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 (option/optional)	Business Management and Entrepreneurship Marc GOLDCHSTEIN (Coordinator) ⌚ 3 credits [lecture: 33h] 📅 first term 🗨️ English
LANG-H500 (option/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 (option/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 (option/optional)	Projet polydaire: expériences didactiques innovantes pour le secondaire Simon-Pierre GORZA (Coordinator) ⌚ 5 credits [project: 150h] 📅 academic year 🗨️ French

Specific courses - Block 2

ELEC-H508 (option)	Thermal power plants Julien BLONDEAU (Coordinator) ⌚ 4 credits [lecture: 34h, tutorial classes: 6h] 📅 second term 🗨️ English
ELEC-H529 (option)	Electric traction Omar HEGAZY (Coordinator) ⌚ 3 credits [lecture: 18h, practical work: 18h] 📅 first term 🗨️ English
GEST-H506 (option)	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
MECA-H414 (option)	Renewable energy technology Julien BLONDEAU (Coordinator) and Johan GYSELINCK ⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨️ English



Module Robotics and Mechatronics - Construction | M-IREMR-M

Bloc 1



Partially common courses



CNST-H421 (option)	Structural analysis and finite elements Peter BERKE (Coordinator) and Lincy Pyl ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨️ English
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MECA-H411 (option) **Mechanical Vibrations** | Arnaud DERAEMAERKER (Coordinator) and Wout Weijtjens
 5 credits [lecture: 36h, tutorial classes: 24h]  first term  English

Specific courses

ELEC-H410 (option) **Real-time computer systems** | François QUITIN (Coordinator)
 5 credits [lecture: 24h, practical work: 36h]  second term  English

ELEC-H516 (option) **Industrial Automation** | Dragomir MILOJEVIC (Coordinator)
 3 credits [lecture: 12h, practical work: 24h]  first term  English

MECA-H401 (option) **Machine elements** | Frank DAERDEN (Coordinator) and Patrick HENDRICK
 5 credits [lecture: 24h, tutorial classes: 24h, practical work: 12h]  second term  English



MECA-H410 (option) **Robotics 1** | Michael VANDAMME (Coordinator)
 5 credits [lecture: 36h, tutorial classes: 24h]  second term  English



MECA-Y403 (option) **Mechatronics 1** | Bram VANDERBORGHT (Coordinator)
 5 credits [lecture: 21h, practical work: 30h, personal assignments: 40h]  first term  English



Common courses - Block 1

Options 'Energy' and 'Aeronautics': MECA-H402 - Turbomachinery is a 5 ECTS course.



Options 'Sustainable Transport' and 'Robotics': MECA-H402 - Turbomachinery is a 3 ECTS course.

ELEC-H406 (option) **Electrical drives** | Johan GYSELINCK (Coordinator) and Omar HEGAZY
 5 credits [lecture: 24h, practical work: 36h]  second term  English

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



MECA-H402 (option) **Turbomachinery** | Patrick HENDRICK (Coordinator)
 5 credits [lecture: 36h, tutorial classes: 20h, practical work: 4h]  second term  English

MECA-H409 (option) **Design methodology** | Alain DELCHAMBRE (Coordinator)
 5 credits [lecture: 24h, tutorial classes: 24h, personal assignments: 12h]  first term  English

MECA-H419 (option) **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



Bloc 2



Partially common courses

MECA-H406 (option) **Composite structures** | Patrick HENDRICK (Coordinator)
 3 credits [lecture: 18h, tutorial classes: 18h]  second term  English



PHYS-H514 (option) **Reliability and safety** | Pierre-Etienne LABEAU (Coordinator)
 3 credits [lecture: 18h, tutorial classes: 18h]  first term  English

Specific courses

MECA-H524 (option) **Mechatronics 2** | Christophe COLLETTE (Coordinator)
 3 credits [lecture: 12h, practical work: 24h]  second term  English

MECA-H533 (option) **Robotics II** | Tom Verstraeten (Coordinator)
 4 credits [lecture: 24h, practical work: 24h]  first term  English

MECA-Y5061 (option) **Manufacturing Technology I** | Herman TERRYN (Coordinator)
 3 credits [lecture: 12h, tutorial classes: 24h]  first term  English

MECA-Y5062 (option) **Manufacturing Technology 2** | Tim BROECKHOVEN (Coordinator)
 3 credits [lecture: 18h, tutorial classes: 12h, personal assignments: 18h]  second term  English



Elective courses

A total of 17 credits chosen from the following

- | | |
|---|--|
| ELEC-H412
<small>(option/optional)</small> | Design and control of electrical machines Johan GYSELINCK (Coordinator)
⌚ 3 credits [lecture: 12h, practical work: 24h] 📅 first term 🗨 English |
| ELEC-H424
<small>(option/optional)</small> | Active medical devices Antoine NONCLERCQ (Coordinator)
⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second term 🗨 English |
| ELEC-H509
<small>(option/optional)</small> | Optimization-based Control Design Emanuele GARONE (Coordinator)
⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 English |
| GEST-Y501
<small>(option/optional)</small> | Business Management and Entrepreneurship Marc GOLDCHSTEIN (Coordinator)
⌚ 3 credits [lecture: 33h] 📅 first term 🗨 English |
| GEST-Y503
<small>(option/optional)</small> | EUTOPIA learning unit : Technological business development project Thomas Crispeels (Coordinator)
⌚ 3 credits [tutorial classes: 13h, personal assignments: 71h] 📅 academic year 🗨 English |
| MECA-H500
<small>(option/optional)</small> | Microfabrication techniques Pierre LAMBERT (Coordinator)
⌚ 5 credits [lecture: 24h, practical work: 12h, personal assignments: 48h] 📅 academic year 🗨 English |
| MECA-H501
<small>(option/optional)</small> | Soft microrobotics Pierre LAMBERT (Coordinator)
⌚ 5 credits [lecture: 24h, practical work: 24h, personal assignments: 24h] 📅 academic year 🗨 English |
| MECA-H525
<small>(option/optional)</small> | Multibody mechanics Dirk LEFEBER (Coordinator)
⌚ 3 credits [lecture: 12h, practical work: 24h] 📅 first term 🗨 English |
| MECA-Y502
<small>(option/optional)</small> | Theory and Practice of Advanced Control Emanuele GARONE (Coordinator) and Michel KINNAERT
⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 second term 🗨 English |
| MECA-Y503
<small>(option/optional)</small> | Case studies with composite materials Maarten Venmans (Coordinator) and Roel CALLEBAUT
⌚ 3 credits [lecture: 24h, personal assignments: 12h] 📅 academic year 🗨 English |
| STAG-H501
<small>(option/optional)</small> | Internship (60 days) Frédéric ROBERT (Coordinator)
⌚ 10 credits [personal assignments: 300h] 📅 first term 🗨 English |
| STAG-H502
<small>(option/optional)</small> | Internship (2 months) Lincy Pyl (Coordinator)
⌚ 6 credits [personal assignments: 180h] 📅 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
<small>(option/optional)</small> | Interfaculty and interdisciplinary program in Healthcare Innovation Hilde STEVENS (Coordinator)
⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 second term 🗨 English |
| CHIM-H504
<small>(option/optional)</small> | Engineering aspects of circular economy Prakash VENKATESAN (Coordinator)
⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English |

DROI-C5174 <small>(option/optional)</small>	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 <small>(option/optional)</small>	Summer School Johan GYSELINCK (Coordinator) ⌚ 5 credits [personal assignments: 5h] 📅 academic year 🗨 English
ELEC-Y514 <small>(option/optional)</small>	Sustainability : an interdisciplinary Approach Cathy MACHARIS (Coordinator) and Waldo Galle ⌚ 6 credits [lecture: 36h, practical work: 24h] 📅 academic year 🗨 English
ENVI-F405 <small>(option/optional)</small>	Climat: sciences et politiques Frank PATTYN (Coordinator) and Louise Knops ⌚ 5 credits [lecture: 40h] 📅 second term 🗨 French
ENVI-F452 <small>(option/optional)</small>	📅 unknown term
ENVI-F454 <small>(option/optional)</small>	Energie: Société et environnement Michel HUART (Coordinator) and Nadine MATTIELLI ⌚ 5 credits [lecture: 30h, practical work: 12h, project: 24h] 📅 first term 🗨 French
GEST-H501 <small>(option/optional)</small>	Logistics Engineering and Management Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h] 📅 first term 🗨 English
GEST-H502 <small>(option/optional)</small>	Supply Chain Performance Analytics Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h, personal assignments: 12h] 📅 second term 🗨 English
GEST-H509 <small>(option/optional)</small>	📅 unknown term
GEST-S101 <small>(option/optional)</small>	Comptabilité financière Gilles GEVERS (Coordinator) and Laurent GHEERAERT ⌚ 5 credits [lecture: 36h, tutorial classes: 8h] 📅 second term 🗨 French
GEST-S318 <small>(option/optional)</small>	Introduction to theoretical finance Laurent GHEERAERT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S421 <small>(option/optional)</small>	Entrepreneurial ecosystems Judith BEHRENS (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S492 <small>(option/optional)</small>	Energy policy, sustainability & management Adel EL Gammal (Coordinator), Julien BLONDEAU and Michel HUART ⌚ 5 credits [lecture: 36h, seminars: 24h] 📅 first term 🗨 English
GEST-Y501 <small>(option/optional)</small>	Business Management and Entrepreneurship Marc GOLDCHSTEIN (Coordinator) ⌚ 3 credits [lecture: 33h] 📅 first term 🗨 English
LANG-H500 <small>(option/optional)</small>	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 <small>(option/optional)</small>	How To Make (almost) Any Experiment Using Digital Fabrication Denis TERWAGNE (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 French
PROJ-H421 <small>(option/optional)</small>	Projet polydaire: expériences didactiques innovantes pour le secondaire Simon-Pierre GORZA (Coordinator) ⌚ 5 credits [project: 150h] 📅 academic year 🗨 French

Module Sustainable Transport and Automotive Engineering | M-IREMR-S

Bloc 1

Partially common courses - Block 1

CNST-H421 <small>(option)</small>	Structural analysis and finite elements Peter BERKE (Coordinator) and Lincy Pyl ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-H411 <small>(option)</small>	Mechanical Vibrations Arnaud DERAEMAERKER (Coordinator) and Wout Weijtjens ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-Y401 <small>(option)</small>	Piston engines Axel Coussement (Coordinator) ⌚ 3 credits [lecture: 26h, practical work: 8h] 📅 first term 🗨 English



Specific courses - Block 1

- ELEC-H527 (option) **Railway technology** | Philippe LATAIRE (Coordinator) and Omar HEGAZY
⌚ 6 credits [lecture: 42h, practical work: 30h] 📅 first and second terms 🗨 English
- ELEC-Y405 (option) **Vehicle dynamics and kinematics** | Kristof HARRI (Coordinator)
⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 English
- ELEC-Y502 (option) **Sustainable mobility and logistics** | Philippe Marc F Lebeau (Coordinator) and Cathy MACHARIS
⌚ 3 credits [lecture: 24h, personal assignments: 62h] 📅 first term 🗨 English
- ELEC-Y510 (option) **Electric and Hybrid Vehicle Traction** | Joeri VAN MIERLO (Coordinator)
⌚ 4 credits [lecture: 12h, tutorial classes: 36h] 📅 second term 🗨 English
- MECA-Y406 (option) **Vehicle aerodynamics** | Ghader Ghorbaniasl (Coordinator)
⌚ 3 credits [tutorial classes: 40h] 📅 second term 🗨 English

Common courses - Block 1

Options 'Energy' and 'Aeronautics' : MECA-H402 - Turbomachinery is a 5 ECTS course.
Options 'Sustainable Transport' and 'Robotics' : MECA-H402 - Turbomachinery is a 3 ECTS course.

- ELEC-H406 (option) **Electrical drives** | Johan GYSELINCK (Coordinator) and Omar HEGAZY
⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English
- MATH-H407 (option) **Control system design** | Emanuele GARONE (Coordinator)
⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 first term 🗨 English
- MECA-H402 (option) **Turbomachinery** | Patrick HENDRICK (Coordinator)
⌚ 5 credits [lecture: 36h, tutorial classes: 20h, practical work: 4h] 📅 second term 🗨 English
- MECA-H409 (option) **Design methodology** | Alain DELCHAMBRE (Coordinator)
⌚ 5 credits [lecture: 24h, tutorial classes: 24h, personal assignments: 12h] 📅 first term 🗨 English
- MECA-H419 (option) **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

Bloc 2

Specific courses - Block 2

- ELEC-Y501 (option) **Vehicle electronics** | Peter Van Den Bossche (Coordinator), Valérie Ann JACOBS, HICHEM SAHLI and Leo VAN BIESEN
⌚ 6 credits [lecture: 36h, practical work: 36h] 📅 first term 🗨 English
- MECA-H532 (option) **Advanced internal combustion engines** | Axel Coussement (Coordinator)
⌚ 3 credits [lecture: 12h, tutorial classes: 14h, practical work: 16h] 📅 second term 🗨 English

Partially common courses - Block 2

- MECA-H406 (option) **Composite structures** | Patrick HENDRICK (Coordinator)
⌚ 3 credits [lecture: 18h, tutorial classes: 18h] 📅 second term 🗨 English
- MECA-Y404 (option) **Fuel cells and batteries** | Annick HUBIN (Coordinator)
⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 English

Elective courses - Block 2

A total of 20 credits chosen from the following

ELEC-Y504 (option/optional)	Supply chain management Cathy MACHARIS (Coordinator) ⌚ 6 credits [lecture: 28h, practical work: 17h, personal assignments: 106h] 📅 second term 🗨 English
ELEC-Y508 (option/optional)	Automotive standardization Peter Van Den Bossche (Coordinator) ⌚ 3 credits [lecture: 12h, personal assignments: 40h] 📅 first term 🗨 English
ELEC-Y514 (option/optional)	Sustainability : an interdisciplinary Approach Cathy MACHARIS (Coordinator) and Waldo Galle ⌚ 6 credits [lecture: 36h, practical work: 24h] 📅 academic year 🗨 English
GEST-Y500 (option/optional)	Entrepreneurship Nikolay DENTCHEV (Coordinator) ⌚ 3 credits [lecture: 15h, tutorial classes: 9h, personal assignments: 62h] 📅 first term 🗨 English
GEST-Y502 (option/optional)	Business Aspects of Technology: Factory of the Future ⌚ 3 credits [lecture: 27h, personal assignments: 59h] 📅 first term 🗨 English
GEST-Y503 (option/optional)	EUTOPIA learning unit : Technological business development project Thomas Crispeels (Coordinator) ⌚ 3 credits [tutorial classes: 13h, personal assignments: 71h] 📅 academic year 🗨 English
INFO-Y512 (option/optional)	Machine Learning Ann NOWE (Coordinator) ⌚ 6 credits [lecture: 26h, tutorial classes: 26h, personal assignments: 150h] 📅 first term 🗨 Dutch
MECA-Y500 (option/optional)	Experimental fluid mechanics Jeroen VAN BEECK (Coordinator) and Tim De Troyer ⌚ 3 credits [lecture: 12h, practical work: 24h] 📅 second term 🗨 English
MECA-Y503 (option/optional)	Case studies with composite materials Maarten Venmans (Coordinator) and Roel CALLEBAUT ⌚ 3 credits [lecture: 24h, personal assignments: 12h] 📅 academic year 🗨 English
STAG-H501 (option/optional)	Internship (60 days) Frédéric ROBERT (Coordinator) ⌚ 10 credits [personal assignments: 300h] 📅 first term 🗨 English
STAG-H502 (option/optional)	Internship (2 months) Lincy Pyl (Coordinator) ⌚ 6 credits [personal assignments: 180h] 📅 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 (option/optional)	Interfaculty and interdisciplinary program in Healthcare Innovation Hilde STEVENS (Coordinator) ⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 second term 🗨 English
CHIM-H504 (option/optional)	Engineering aspects of circular economy Prakash VENKATESAN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English
DROI-C5174 (option/optional)	📅 unknown term
EDUC-H601 (option/optional)	Summer School Johan GYSELINCK (Coordinator) ⌚ 5 credits [personal assignments: 5h] 📅 academic year 🗨 English
ELEC-Y514 (option/optional)	Sustainability : an interdisciplinary Approach Cathy MACHARIS (Coordinator) and Waldo Galle ⌚ 6 credits [lecture: 36h, practical work: 24h] 📅 academic year 🗨 English

ENVI-F405 <small>(option/optional)</small>	Climat: sciences et politiques Frank PATTYN (Coordinator) and Louise Knops ⌚ 5 credits [lecture: 40h] 📅 second term 🗨️ French
ENVI-F452 <small>(option/optional)</small>	Environmental impact analysis and management Wouter ACHTEN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 12h, project: 24h] 📅 first term 🗨️ English/French
ENVI-F454 <small>(option/optional)</small>	Energie: Société et environnement Michel HUART (Coordinator) and Nadine MATTIELLI ⌚ 5 credits [lecture: 30h, practical work: 12h, project: 24h] 📅 first term 🗨️ French
GEST-H501 <small>(option/optional)</small>	Logistics Engineering and Management Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h] 📅 first term 🗨️ English
GEST-H502 <small>(option/optional)</small>	Supply Chain Performance Analytics Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h, personal assignments: 12h] 📅 second term 🗨️ English
GEST-H509 <small>(option/optional)</small>	📅 unknown term
GEST-S101 <small>(option/optional)</small>	Comptabilité financière Gilles GEVERS (Coordinator) and Laurent GHEERAERT ⌚ 5 credits [lecture: 36h, tutorial classes: 8h] 📅 second term 🗨️ French
GEST-S318 <small>(option/optional)</small>	Introduction to theoretical finance Laurent GHEERAERT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ English
GEST-S421 <small>(option/optional)</small>	Entrepreneurial ecosystems Judith BEHRENS (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨️ English
GEST-S492 <small>(option/optional)</small>	Energy policy, sustainability & management Adel EL Gammal (Coordinator), Julien BLONDEAU and Michel HUART ⌚ 5 credits [lecture: 36h, seminars: 24h] 📅 first term 🗨️ English
GEST-Y501 <small>(option/optional)</small>	Business Management and Entrepreneurship Marc GOLDCHSTEIN (Coordinator) ⌚ 3 credits [lecture: 33h] 📅 first term 🗨️ English
LANG-H500 <small>(option/optional)</small>	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 <small>(option/optional)</small>	How To Make (almost) Any Experiment Using Digital Fabrication Denis TERWAGNE (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨️ French
PROJ-H421 <small>(option/optional)</small>	Projet polydaire: expériences didactiques innovantes pour le secondaire Simon-Pierre GORZA (Coordinator) ⌚ 5 credits [project: 150h] 📅 academic year 🗨️ French