

Master of science in Electromechanical Engineering

Focus Professional

Bloc 1 | M-IREMR | MA-IREM

Projects - Block 1

One course chosen from the following

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|-------------------------|---|
| 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 |

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

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|-----------|--|
| M-IREMR-A | Module Aeronautics > <i>page</i> |
| M-IREMR-E | Module Energy > <i>page</i> |
| M-IREMR-M | Module Robotics and Mechatronics - Construction > <i>page</i> |
| M-IREMR-S | Module Sustainable Transport and Automotive Engineering > <i>page</i> |

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-H420 (option)	Piston Engines Axel Coussement (Coordinator) ⌚ 3 credits [lecture: 26h, practical work: 8h] 📅 first term 🗨 English

Specific courses

MECA-H407 (option)	Computational Modelling in Aerospace Axel Coussement (Coordinator) ⌚ 3 credits [lecture: 18h, tutorial classes: 12h] 📅 second term 🗨 English
MECA-H421 (option)	Aircraft Structures ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
MECA-H423 (option)	Aerospace Seminars : Sustainability, Space & Drones Thierry MAGIN (Coordinator) ⌚ 3 credits [lecture: 18h, personal assignments: 18h] 📅 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

Common courses - Block 1

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

MECA-H422 (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
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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 Axel Coussement (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗣 English
MECA-H522 (option)	Applied Computational Fluid Dynamics Mark RUNACRES (Coordinator) and Aurélie Bellemans ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, personal assignments: 20h] 📅 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-Y408 (option)	Avionics ⌚ 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-H534 (option/optional)	Acoustics Jean-Louis MIGEOT (Coordinator) ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗣 English
MECA-Y014 (option/optional)	Aircraft systems Tim De Troyer (Coordinator) ⌚ 4 credits [lecture: 30h, project: 12h] 📅 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, personal assignments: 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 (40 days) 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] 📅 first 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, personal assignments: 100h] 📅 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: 24h, tutorial classes: 24h, practical work: 12h] 📅 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)	Ethique de l'ingénieur ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗨 French
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
LANG-H500 (option/optional)	English for professional purposes Alexander CORNFORD (Coordinator) ⌚ 5 credits [tutorial classes: 48h, personal assignments: 12h] 📅 first and second terms 🗨 English
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-H420** (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: 22h, tutorial classes: 14h] 📅 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) ⌚ 4 credits [lecture: 12h, tutorial classes: 18h, practical work: 18h] 📅 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-H510 (option/optional)	Risk-based methodologies for energy systems Pierre-Etienne LABEAU (Coordinator) and Pierre HENNEAUX ⌚ 4 credits [lecture: 24h, personal assignments: 24h] 📅 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: 30h, practical work: 12h, seminars: 6h, field trips: 20h] 📅 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 (40 days) 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] 📅 first 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, personal assignments: 100h] 📅 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: 24h, tutorial classes: 24h, practical work: 12h] 📅 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)	Ethique de l'ingénieur ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗨 French
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
LANG-H500 (option/optional)	English for professional purposes Alexander CORNFORD (Coordinator) ⌚ 5 credits [tutorial classes: 48h, personal assignments: 12h] 📅 first and second terms 🗨 English
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
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
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ELEC-H516 (option)	Industrial Automation Dragomir MILOJEVIC (Coordinator) ⌚ 3 credits [lecture: 12h, practical work: 24h] 📅 first 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
MECA-Y410 (option)	Machine elements Frank DAERDEN (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h, practical work: 12h] 📅 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

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: 22h, tutorial classes: 14h] 📅 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 ⌚ 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 (option/optional)	Design and control of electrical machines Johan GYSELINCK (Coordinator) ⌚ 4 credits [lecture: 12h, tutorial classes: 18h, practical work: 18h] 📅 first term 🗣 English
ELEC-H424 (option/optional)	Active medical devices Antoine NONCLERCQ (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second 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
MECA-H500 (option/optional)	Microfabrication techniques Pierre LAMBERT (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 12h, personal assignments: 48h] 📅 academic year 🗣 English
MECA-H501 (option/optional)	Soft microrobotics Pierre LAMBERT (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 24h, personal assignments: 24h] 📅 academic year 🗣 English
MECA-H525 (option/optional)	Multibody mechanics Dirk LEFEBER (Coordinator) ⌚ 3 credits [lecture: 12h, practical work: 24h] 📅 first term 🗣 English
MECA-H534 (option/optional)	Acoustics Jean-Louis MIGEOT (Coordinator) ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗣 English
MECA-H537 (option/optional)	Naval Robotics Emanuele GARONE (Coordinator) ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗣 English
MECA-Y502 (option/optional)	Theory and Practice of Advanced Control Emanuele GARONE (Coordinator) and Michel KINNAERT ⌚ 4 credits [lecture: 24h, 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 (40 days) 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] 📅 first 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, personal assignments: 100h] 📅 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: 24h, tutorial classes: 24h, practical work: 12h] 📅 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)	Ethique de l'ingénieur ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗨 French
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
LANG-H500 (option/optional)	English for professional purposes Alexander CORNFORD (Coordinator) ⌚ 5 credits [tutorial classes: 48h, personal assignments: 12h] 📅 first and second terms 🗨 English
PROJ-H421 (option/optional)	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 (option)	Structural analysis and finite elements Peter BERKE (Coordinator) and Lincy Pyl ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-H411 (option)	Mechanical Vibrations Arnaud DERAEMAERKER (Coordinator) and Wout Weijtjens ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-H420 (option)	Piston Engines Axel Coussement (Coordinator) ⌚ 3 credits [lecture: 26h, practical work: 8h] 📅 first term 🗨 English

Specific courses - Block 1

ELEC-H527 (option)	Railway technology Valérie Ann JACOBS (Coordinator), Omar HEGAZY and Philippe LATAIRE ⌚ 6 credits [lecture: 42h, practical work: 30h] 📅 first and second terms 🗨 English
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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: 114h] 📅 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, personal assignments: 100h] 📅 academic year 🗨 English
ELEC-Y560 (option/optional)	Operations Management ⌚ 6 credits [lecture: 24h, tutorial classes: 27h] 📅 first term 🗨 French
GEST-Y500 (option/optional)	Entrepreneurship Thomas Crispeels (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 Kevin De Moortel (Coordinator) ⌚ 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-H534 (option/optional)	Acoustics Jean-Louis MIGEOT (Coordinator) ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-H537 (option/optional)	Naval Robotics Emanuele GARONE (Coordinator) ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 second 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-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 (40 days) 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] 📅 first 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, personal assignments: 100h] 📅 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: 24h, tutorial classes: 24h, practical work: 12h] 📅 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)	Ethique de l'ingénieur ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗣 French
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
LANG-H500 (option/optional)	English for professional purposes Alexander CORNFORD (Coordinator) ⌚ 5 credits [tutorial classes: 48h, personal assignments: 12h] 📅 first and second terms 🗣 English
PROJ-H421 (option/optional)	Projet polydaire: expériences didactiques innovantes pour le secondaire Simon-Pierre GORZA (Coordinator) ⌚ 5 credits [project: 150h] 📅 academic year 🗣 French