



# Master of science in Electromechanical Engineering

Focus Professional

## Programme mnemonic

MA-IREM

> Focus *Professional* : M-IREM

## Exists also in

> Focus *Operations engineering and management* : M-IREM

## Studies level

Master 120 credits

## Learning language

english

## Schedule

office hours

## Studies category / subcategory

Sciences and technics / Sciences and technics

## Campus

Other campus and Solbosch

## Programme objectives

Aeronautics, automation, mechanical engineering and design, vibrations, robotics, electrical motors, renewable energy, transportation, piston engines, CAD, management, logistics, quality, etc. These are all examples showing that the majority of companies, whatever the sector they belong to, have a growing demand for engineers skilled in electrical, mechanical or electromechanical engineering. And this is why this programme has so many different facets. Students opting for the electromechanical engineering specialisation in their third block of the Bachelor course (block 3 of BA) can carry on and take a Master degree in electromechanical engineering, specialising in either management and technology or electro-mechanics. The latter, organised together with the VUB since 2011-2012, is taught in English and is part of the BRUFACE initiative.

Graduates of this programme benefit from a compromise between, on the one hand, important base training preparing students for work in design and management and, on the other hand, a specialisation in a particular discipline.

A wide-ranging base curriculum opening the door to various options

The technology specialisation offered by the electromechanical engineering department is based on wide-ranging training backed up by various options.

Block 3 of BA and the first half of block 1 of MA constitute a common base, ensuring that students gain a firm understanding of electricity, electronics, automation, fluid mechanics, electrical and thermal machines and their associated calculation methods. These lead to the following MA2 options: aeronautics, mechatronic construction, energy and, last but not least, transportation.

A special case: the "Management and Technology" specialisation Students heading straight for a management career can opt in block 1 of MA for the "Management and Technology" specialisation. This is held jointly with the Solvay Brussels School of Economics and Management (SBS-EM). This Masters course has no particular prerequisites and can be taken whatever the option taken in block 3 of BA.

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## Programme's added value

The projects, end-of-course dissertations, work placements, international exchanges

Looking at the electromechanical engineering specialisation, the block 3 of BA project only accounts for 2 ECTS, thereby hardly encroaching on the wide-ranging base curriculum. This is a CAD project, with either an electrical or mechanical dimension. Block 1 of MA also contains an individual project worth 5 ECTS (with the exception of teamwork-based development cooperation, Eco-Marathon and Robotics Cup projects). Students indicate their preferences, choosing from a large range of subjects with a technological dimension (mechanical, electrical or combined), before the department optimises which students are assigned to which projects. Students can also elect to lead groups of BA1 students, should they want to develop their organisation and leadership capabilities.

In Block 2 of MA, the end-of-course dissertation (worth 20 ECTS) is done in one of the electromechanical departments or in another department providing appropriate subjects, possibly in conjunction with an industrial company or with a Belgian or foreign research centre. The subjects suggested by the departments are closely connected to their research activities, and dissertations are therefore supervised by people full of motivation and wanting to see successful research results. Departments very often suggest subjects where a student will be in contact with a company directly interested in the results.

All Masters programmes in the electromechanical engineering field offer the opportunity of doing a 12-week work placement (11 weeks in the aeronautics sector). Supervised jointly by a company supervisor and a Faculty supervisor, work placements may be linked with the end-of-course dissertation. Work placements are done between the beginning of July and the end of October, with the exception of aeronautics placements which end in mid/late September. Students taking the Management and Technology specialisation choose between a mandatory placement and an international exchange.

As with the Faculty's other Master courses, the electromechanical engineering department allows student to take part in an international exchange programme for a term or a year, either in block 1 or 2 of MA. The one exception here is the Management and Technology specialisation, where the exchange must take place in Block 2 of MA. A further option is to take a twin degree, such as that offered by Sup'Aéro in Toulouse.

Development cooperation, Eco-Marathon and Robotics Cup projects). Students indicate their preferences, choosing from a large range of subjects with a technological dimension (mechanical, electrical or combined), before the department optimises which students are assigned to which projects. Students can also elect to lead groups of BA1 students, should they want to develop their organisation and leadership capabilities.

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the exception of aeronautics placements which end in mid/late September. Students taking the Management and Technology specialisation choose between a mandatory placement and an international exchange.

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## Succeed in your studies

### Choose

The information and guidance counsellors at the InfOR-études [<https://www.ulb.be/en/studies-info-desk-1>] service will help you choose your studies throughout the year.

### Succeed

Take part in preparatory courses [<https://www.ulb.be/en/studies-info-desk-1>] or get help to succeed [<https://www.ulb.be/en/studies-info-desk-1>], before or during your studies.

### Get help

Apply for financial aid, look for accommodation or a student job, get support [<https://www.ulb.be/fr/aides-services-et-accompagnement/aid-services-and-support-1>] for your specific needs.

## Job opportunities

The advantages of this programme result from the compromise between, on the one hand, important base skills preparing engineers for work in design and management and, on the other hand, a specialisation in a particular discipline.

Electromechanical engineers will also find wide-ranging career opportunities in engineering companies, industry, public authorities, research and higher education, and in the services sector.

Though there are a large number of openings in companies in the area of process automation, computerised management, electricity, electronics, etc., the majority of companies in other sectors (chemicals, petrochemicals, metallurgy, etc.) also have a growing need for skilled and versatile electromechanical engineers.

### Contacts

 [polytech@ulb.be](mailto:polytech@ulb.be)

 <https://polytech.ulb.be/fr/les-etudes/masters/electromecanique>



**Jury President**

Johan GYSELINCK

**Jury Secretaries**

Emanuele GARONE (Professional) and Simon-Pierre GORZA (Professional)



# 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 / 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 \(chef de projet\)](#) | Péter 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 Mechanical Construction](#) > *page*
- M-IREMR-S [Module Sustainable Transport and Automotive Engineering](#) > *page*

# Master of science in Electromechanical Engineering

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## 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 Mechanical 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** | Péter 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 DERAEMAEKER (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 and Alassane Ballé NDIAYE  
 4 credits [lecture: 36h, tutorial classes: 12h]  second term  English

### Bloc 2

#### Specific courses - Block 2

- MECA-H422 (option) **Technology of the Aerospace Industry** | Jan BOECKX (Coordinator) and Thierry MAGIN  
 3 credits [lecture: 24h, tutorial classes: 6h, practical work: 6h]  first and second terms  English

MECA-H506 (option)	<b>Aircraft performance and stability</b>   Axel COUSSEMENT (Coordinator) ⌚ 4 credits [lecture: 28h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-H507 (option)	<b>Aircraft propulsion</b>   Patrick HENDRICK (Coordinator) ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-H508 (option)	<b>Aircraft conceptual design</b>   Patrick HENDRICK (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English
MECA-H522 (option)	<b>Applied Computational Fluid Dynamics</b>   Mark RUNACRES (Coordinator) and Aurélie BELLEMANS ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, personal assignments: 20h] 📅 first term 🗨 English
MECA-Y405 (option)	<b>Damage testing in aeronautics</b>   Dieter De Baere (Coordinator) and Michaël Hinderdael ⌚ 3 credits [lecture: 24h, tutorial classes: 12h] 📅 second term 🗨 English
MECA-Y408 (option)	<b>Avionics</b> ⌚ 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)	<b>Advanced computational structural mechanics</b>   Thierry J. MASSART (Coordinator) ⌚ 4 credits [lecture: 12h, practical work: 36h] 📅 first term 🗨 English
ELEC-H509 (option/optional)	<b>Optimization-based Control Design</b>   Emanuele GARONE (Coordinator) ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 English
GEST-Y503 (option/optional)	<b>EUTOPIA learning unit : Technological business development project</b>   Thomas CRISPEELS (Coordinator) ⌚ 3 credits [tutorial classes: 13h, personal assignments: 71h] 📅 academic year 🗨 English
MATH-H503 (option/optional)	<b>Model-Based and Data-Driven Fault Detection and Isolation</b>   Michel KINNAERT (Coordinator) ⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 second term 🗨 English
MECA-H523 (option/optional)	<b>Helicopters</b> ⌚ 3 credits [lecture: 24h, tutorial classes: 12h] 📅 second term 🗨 English
MECA-H534 (option/optional)	<b>Acoustics</b>   Jean-Louis MIGEOT (Coordinator) ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-Y014 (option/optional)	<b>Aircraft systems</b>   Tim DE TROYER (Coordinator) ⌚ 4 credits [lecture: 30h, project: 12h] 📅 first term 🗨 English
MECA-Y500 (option/optional)	<b>Experimental fluid mechanics</b>   Jeroen VAN BEECK (Coordinator) and Tim DE TROYER ⌚ 3 credits [lecture: 12h, practical work: 24h] 📅 second term 🗨 English
MECA-Y501 (option/optional)	<b>Aircraft specification and certification</b>   Jean-Jacques SPEYER (Coordinator) ⌚ 3 credits [lecture: 18h, personal assignments: 18h] 📅 second term 🗨 English
MECA-Y507 (option/optional)	<b>Wind Turbine Aerodynamics and Design</b>   Mark RUNACRES (Coordinator) ⌚ 4 credits [lecture: 21h, practical work: 21h] 📅 first term 🗨 English
STAG-H501 (option/optional)	<b>Internship (60 days)</b>   Frédéric ROBERT (Coordinator) ⌚ 10 credits [personal assignments: 300h] 📅 first term 🗨 English
STAG-H502 (option/optional)	<b>Internship (40 days)</b>   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)	<b>Interfaculty and interdisciplinary program in Healthcare Innovation</b>   Hilde STEVENS (Coordinator) ⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 second term 🗨 English
CHIM-H504 (option/optional)	<b>Engineering aspects of circular economy</b>   Prakash VENKATESAN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 first term 🗨 English
DROI-C5174 (option/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 (option/optional)	<b>Summer School</b>   Johan GYSELINCK (Coordinator) ⌚ 5 credits [personal assignments: 5h] 📅 academic year 🗨 English
ELEC-Y514 (option/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 (option/optional)	<b>Climat: sciences et politiques</b>   Frank PATTYN (Coordinator) and Julien VANDEBURIE ⌚ 5 credits [lecture: 40h] 📅 second term 🗨 French
ENVI-F452 (option/optional)	<b>Environmental impact analysis and management</b>   Wouter ACHTEN (Coordinator) and Edgar Towa Kouokam ⌚ 5 credits [lecture: 24h, practical work: 12h, project: 24h] 📅 first term 🗨 English/French
ENVI-F454 (option/optional)	<b>Energie: Société et environnement</b>   Michel HUART (Coordinator) and Nadine MATTIELLI ⌚ 5 credits [lecture: 24h, tutorial classes: 24h, practical work: 12h] 📅 first term 🗨 French
GEST-H501 (option/optional)	<b>Logistics Engineering and Management</b>   Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h] 📅 first term 🗨 English
GEST-H502 (option/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 (option/optional)	<b>Ethique de l'ingénieur</b> ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗨 French
GEST-S101 (option/optional)	<b>Comptabilité financière</b>   Gilles GEVERS (Coordinator) and Laurent GHEERAERT ⌚ 5 credits [lecture: 36h, tutorial classes: 8h] 📅 second term 🗨 French
GEST-S318 (option/optional)	<b>Introduction to theoretical finance</b>   Laurent GHEERAERT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S421 (option/optional)	<b>Entrepreneurial ecosystems</b>   Judith BEHRENS (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S492 (option/optional)	<b>Energy policy, sustainability &amp; management</b>   Adel El Gammal (Coordinator), Julien BLONDEAU and Michel HUART ⌚ 5 credits [lecture: 36h, seminars: 24h] 📅 first term 🗨 English
GEST-Y501 (option/optional)	<b>Business Management and Entrepreneurship</b>   Marc Goldchstein (Coordinator) ⌚ 3 credits [lecture: 33h] 📅 first and second terms 🗨 English
LANG-H500 (option/optional)	<b>English for professional purposes</b>   Alexander CORNFORD (Coordinator) ⌚ 5 credits [tutorial classes: 48h, personal assignments: 12h] 📅 first and second terms 🗨 English
PROJ-H421 (option/optional)	<b>Projet polydaire: expériences didactiques innovantes pour le secondaire</b>   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 and Alassane Ballé NDIAYE  
⌚ 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)	<b>Design and control of electrical machines</b>   Johan GYSELINCK (Coordinator) ⌚ 4 credits [lecture: 12h, tutorial classes: 18h, practical work: 18h] 📅 first term 🗣 English
ELEC-H543 (option/optional)	<b>Electric Power Systems II</b>   Pierre HENNEAUX (Coordinator) ⌚ 5 credits [lecture: 30h, practical work: 30h] 📅 second term 🗣 English
MATH-H503 (option/optional)	<b>Model-Based and Data-Driven Fault Detection and Isolation</b>   Michel KINNAERT (Coordinator) ⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 second term 🗣 English
MATH-H510 (option/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
MECA-H532 (option/optional)	<b>Advanced internal combustion engines</b>   Axel COUSSEMENT (Coordinator) ⌚ 3 credits [lecture: 12h, tutorial classes: 14h, practical work: 16h] 📅 second term 🗣 English
MECA-Y507 (option/optional)	<b>Wind Turbine Aerodynamics and Design</b>   Mark RUNACRES (Coordinator) ⌚ 4 credits [lecture: 21h, practical work: 21h] 📅 first term 🗣 English
PHYS-H408 (option/optional)	<b>Operation, control and safety of nuclear systems</b>   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)	<b>Internship (60 days)</b>   Frédéric ROBERT (Coordinator) ⌚ 10 credits [personal assignments: 300h] 📅 first term 🗣 English
STAG-H502 (option/optional)	<b>Internship (40 days)</b>   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)	<b>Interfaculty and interdisciplinary program in Healthcare Innovation</b>   Hilde STEVENS (Coordinator) ⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 second term 🗣 English
CHIM-H504 (option/optional)	<b>Engineering aspects of circular economy</b>   Prakash VENKATESAN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 first term 🗣 English
DROI-C5174 (option/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 (option/optional)	<b>Summer School</b>   Johan GYSELINCK (Coordinator) ⌚ 5 credits [personal assignments: 5h] 📅 academic year 🗣 English
ELEC-Y514 (option/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 (option/optional)	<b>Climat: sciences et politiques</b>   Frank PATTYN (Coordinator) and Julien VANDEBURIE ⌚ 5 credits [lecture: 40h] 📅 second term 🗣 French



ENVI-F452 (option/optional)	<b>Environmental impact analysis and management</b>   Wouter ACHTEN (Coordinator) and Edgar Towa Kouokam ⌚ 5 credits [lecture: 24h, practical work: 12h, project: 24h] 📅 first term 🗨 English/French
ENVI-F454 (option/optional)	<b>Energie: Société et environnement</b>   Michel HUART (Coordinator) and Nadine MATTIELLI ⌚ 5 credits [lecture: 24h, tutorial classes: 24h, practical work: 12h] 📅 first term 🗨 French
GEST-H501 (option/optional)	<b>Logistics Engineering and Management</b>   Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h] 📅 first term 🗨 English
GEST-H502 (option/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 (option/optional)	<b>Ethique de l'ingénieur</b> ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗨 French
GEST-S101 (option/optional)	<b>Comptabilité financière</b>   Gilles GEVERS (Coordinator) and Laurent GHEERAERT ⌚ 5 credits [lecture: 36h, tutorial classes: 8h] 📅 second term 🗨 French
GEST-S318 (option/optional)	<b>Introduction to theoretical finance</b>   Laurent GHEERAERT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S421 (option/optional)	<b>Entrepreneurial ecosystems</b>   Judith BEHRENS (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S492 (option/optional)	<b>Energy policy, sustainability &amp; management</b>   Adel El Gammal (Coordinator), Julien BLONDEAU and Michel HUART ⌚ 5 credits [lecture: 36h, seminars: 24h] 📅 first term 🗨 English
LANG-H500 (option/optional)	<b>English for professional purposes</b>   Alexander CORNFORD (Coordinator) ⌚ 5 credits [tutorial classes: 48h, personal assignments: 12h] 📅 first and second terms 🗨 English
PROJ-H421 (option/optional)	<b>Projet polydaire: expériences didactiques innovantes pour le secondaire</b>   Simon-Pierre GORZA (Coordinator) ⌚ 5 credits [project: 150h] 📅 academic year 🗨 French

## Specific courses - Block 2

ELEC-H508 (option)	<b>Thermal power plants</b>   Julien BLONDEAU (Coordinator) ⌚ 4 credits [lecture: 34h, tutorial classes: 6h] 📅 second term 🗨 English
ELEC-H529 (option)	<b>Electric traction</b>   Omar HEGAZY (Coordinator) ⌚ 3 credits [lecture: 18h, practical work: 18h] 📅 first term 🗨 English
GEST-H506 (option)	<b>Energy policy and management</b>   Pierre HENNEAUX (Coordinator), Adel El Gammal and Benjamin GENET ⌚ 5 credits [lecture: 42h, practical work: 18h] 📅 first and second terms 🗨 English
MECA-H414 (option)	<b>Renewable energy technology</b>   Julien BLONDEAU (Coordinator) and Johan GYSELINCK ⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 English

## Module Robotics and Mechanical Construction | M-IREMR-M

### Bloc 1

### Partially common courses

CNST-H421 (option)	<b>Structural analysis and finite elements</b>   Péter BERKE (Coordinator) and Lincy PYL ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-H411 (option)	<b>Mechanical Vibrations</b>   Arnaud DERAEMAER (Coordinator) and Wout Weijtjens ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English

### Specific courses

ELEC-H410 (option)	<b>Real-time computer systems</b>   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** | Patrick HENDRICK (Coordinator) and Pablo Lopez Garcia  
⌚ 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 and Allassane Ballé NDIAYE  
⌚ 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 Verstraten (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 (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)	<b>Active medical devices</b>   Antoine NONCLERCQ (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second term 🗨 English
ELEC-H509 (option/optional)	<b>Optimization-based Control Design</b>   Emanuele GARONE (Coordinator) ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 English
GEST-Y501 (option/optional)	<b>Business Management and Entrepreneurship</b>   Marc Goldchstein (Coordinator) ⌚ 3 credits [lecture: 33h] 📅 first and second terms 🗨 English
GEST-Y503 (option/optional)	<b>EUTOPIA learning unit : Technological business development project</b>   Thomas CRISPEELS (Coordinator) ⌚ 3 credits [tutorial classes: 13h, personal assignments: 71h] 📅 academic year 🗨 English
MECA-H500 (option/optional)	<b>Microfabrication techniques</b>   Pierre LAMBERT (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 12h, personal assignments: 48h] 📅 academic year 🗨 English
MECA-H501 (option/optional)	<b>Soft microrobotics</b>   Pierre LAMBERT (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 24h, personal assignments: 24h] 📅 academic year 🗨 English
MECA-H525 (option/optional)	<b>Multibody mechanics</b>   Dirk LEFEBER (Coordinator) ⌚ 3 credits [lecture: 12h, practical work: 24h] 📅 first term 🗨 English
MECA-H534 (option/optional)	<b>Acoustics</b>   Jean-Louis MIGEOT (Coordinator) ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-H537 (option/optional)	<b>Naval Robotics</b>   Emanuele GARONE (Coordinator) ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
MECA-Y502 (option/optional)	<b>Theory and Practice of Advanced Control</b>   Emanuele GARONE (Coordinator) and Michel KINNAERT ⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 second term 🗨 English
MECA-Y503 (option/optional)	<b>Case studies with composite materials</b>   Maarten Venmans (Coordinator) and Roel CALLEBAUT ⌚ 3 credits [lecture: 24h, personal assignments: 12h] 📅 academic year 🗨 English
STAG-H501 (option/optional)	<b>Internship (60 days)</b>   Frédéric ROBERT (Coordinator) ⌚ 10 credits [personal assignments: 300h] 📅 first term 🗨 English
STAG-H502 (option/optional)	<b>Internship (40 days)</b>   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)	<b>Interfaculty and interdisciplinary program in Healthcare Innovation</b>   Hilde STEVENS (Coordinator) ⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 second term 🗨 English
CHIM-H504 (option/optional)	<b>Engineering aspects of circular economy</b>   Prakash VENKATESAN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 first term 🗨 English
DROI-C5174 (option/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 (option/optional)	<b>Summer School</b>   Johan GYSELINCK (Coordinator) ⌚ 5 credits [personal assignments: 5h] 📅 academic year 🗨 English
ELEC-Y514 (option/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 (option/optional)	<b>Climat: sciences et politiques</b>   Frank PATTYN (Coordinator) and Julien VANDEBURIE ⌚ 5 credits [lecture: 40h] 📅 second term 🗨 French
ENVI-F452 (option/optional)	<b>Environmental impact analysis and management</b>   Wouter ACHTEN (Coordinator) and Edgar Towa Kouokam ⌚ 5 credits [lecture: 24h, practical work: 12h, project: 24h] 📅 first term 🗨 English/French
ENVI-F454 (option/optional)	<b>Energie: Société et environnement</b>   Michel HUART (Coordinator) and Nadine MATTIELLI ⌚ 5 credits [lecture: 24h, tutorial classes: 24h, practical work: 12h] 📅 first term 🗨 French
GEST-H501 (option/optional)	<b>Logistics Engineering and Management</b>   Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h] 📅 first term 🗨 English
GEST-H502 (option/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 (option/optional)	<b>Ethique de l'ingénieur</b> ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗨 French
GEST-S101 (option/optional)	<b>Comptabilité financière</b>   Gilles GEVERS (Coordinator) and Laurent GHEERAERT ⌚ 5 credits [lecture: 36h, tutorial classes: 8h] 📅 second term 🗨 French
GEST-S318 (option/optional)	<b>Introduction to theoretical finance</b>   Laurent GHEERAERT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S421 (option/optional)	<b>Entrepreneurial ecosystems</b>   Judith BEHRENS (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S492 (option/optional)	<b>Energy policy, sustainability &amp; management</b>   Adel El Gammal (Coordinator), Julien BLONDEAU and Michel HUART ⌚ 5 credits [lecture: 36h, seminars: 24h] 📅 first term 🗨 English
LANG-H500 (option/optional)	<b>English for professional purposes</b>   Alexander CORNFORD (Coordinator) ⌚ 5 credits [tutorial classes: 48h, personal assignments: 12h] 📅 first and second terms 🗨 English
PROJ-H421 (option/optional)	<b>Projet polydaire: expériences didactiques innovantes pour le secondaire</b>   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)	<b>Structural analysis and finite elements</b>   Péter BERKE (Coordinator) and Lincy PYL ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-H411 (option)	<b>Mechanical Vibrations</b>   Arnaud DERAEMAERKER (Coordinator) and Wout Weijtjens ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-H420 (option)	<b>Piston Engines</b>   Axel COUSSEMENT (Coordinator) ⌚ 3 credits [lecture: 26h, practical work: 8h] 📅 first term 🗨 English

#### Specific courses - Block 1

ELEC-H527 (option)	<b>Railway technology</b>   Valéry 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 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 and Alassane Ballé NDIAYE  
⌚ 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), Valéry 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)	<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
ELEC-Y560 (option/optional)	<b>Operations Management</b> ⌚ 6 credits [lecture: 24h, tutorial classes: 27h] 📅 first term 🗨 French
GEST-Y500 (option/optional)	<b>Entrepreneurship</b>   Thomas CRISPEELS (Coordinator) ⌚ 3 credits [lecture: 15h, tutorial classes: 9h, personal assignments: 62h] 📅 first term 🗨 English
GEST-Y501 (option/optional)	<b>Business Management and Entrepreneurship</b>   Marc Goldchstein (Coordinator) ⌚ 3 credits [lecture: 33h] 📅 first and second terms 🗨 English
GEST-Y502 (option/optional)	<b>Business Aspects of Technology: Factory of the Future</b>   Kevin De Moortel (Coordinator) ⌚ 3 credits [lecture: 27h, personal assignments: 59h] 📅 first term 🗨 English
GEST-Y503 (option/optional)	<b>EUTOPIA learning unit : Technological business development project</b>   Thomas CRISPEELS (Coordinator) ⌚ 3 credits [tutorial classes: 13h, personal assignments: 71h] 📅 academic year 🗨 English
INFO-Y512 (option/optional)	<b>Machine Learning</b>   Ann NOWE (Coordinator) ⌚ 6 credits [lecture: 26h, tutorial classes: 26h, personal assignments: 150h] 📅 first term 🗨 Dutch
MECA-H534 (option/optional)	<b>Acoustics</b>   Jean-Louis MIGEOT (Coordinator) ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 English
MECA-H537 (option/optional)	<b>Naval Robotics</b>   Emanuele GARONE (Coordinator) ⌚ 4 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
MECA-Y500 (option/optional)	<b>Experimental fluid mechanics</b>   Jeroen VAN BEECK (Coordinator) and Tim DE TROYER ⌚ 3 credits [lecture: 12h, practical work: 24h] 📅 second term 🗨 English
MECA-Y503 (option/optional)	<b>Case studies with composite materials</b>   Maarten Venmans (Coordinator) and Roel CALLEBAUT ⌚ 3 credits [lecture: 24h, personal assignments: 12h] 📅 academic year 🗨 English
STAG-H501 (option/optional)	<b>Internship (60 days)</b>   Frédéric ROBERT (Coordinator) ⌚ 10 credits [personal assignments: 300h] 📅 first term 🗨 English
STAG-H502 (option/optional)	<b>Internship (40 days)</b>   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)	<b>Interfaculty and interdisciplinary program in Healthcare Innovation</b>   Hilde STEVENS (Coordinator) ⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 second term 🗨 English
CHIM-H504 (option/optional)	<b>Engineering aspects of circular economy</b>   Prakash VENKATESAN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 first term 🗨 English
DROI-C5174 (option/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 <small>(option/optional)</small>	<b>Summer School</b>   Johan GYSELINCK (Coordinator) ⌚ 5 credits [personal assignments: 5h] 📅 academic year 🗨 English
ELEC-Y514 <small>(option/optional)</small>	<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 <small>(option/optional)</small>	<b>Climat: sciences et politiques</b>   Frank PATTYN (Coordinator) and Julien VANDEBURIE ⌚ 5 credits [lecture: 40h] 📅 second term 🗨 French
ENVI-F452 <small>(option/optional)</small>	<b>Environmental impact analysis and management</b>   Wouter ACHTEN (Coordinator) and Edgar Towa Kouokam ⌚ 5 credits [lecture: 24h, practical work: 12h, project: 24h] 📅 first term 🗨 English/French
ENVI-F454 <small>(option/optional)</small>	<b>Energie: Société et environnement</b>   Michel HUART (Coordinator) and Nadine MATTIELLI ⌚ 5 credits [lecture: 24h, tutorial classes: 24h, practical work: 12h] 📅 first term 🗨 French
GEST-H501 <small>(option/optional)</small>	<b>Logistics Engineering and Management</b>   Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h] 📅 first term 🗨 English
GEST-H502 <small>(option/optional)</small>	<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 <small>(option/optional)</small>	<b>Ethique de l'ingénieur</b> ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗨 French
GEST-S101 <small>(option/optional)</small>	<b>Comptabilité financière</b>   Gilles GEVERS (Coordinator) and Laurent GHEERAERT ⌚ 5 credits [lecture: 36h, tutorial classes: 8h] 📅 second term 🗨 French
GEST-S318 <small>(option/optional)</small>	<b>Introduction to theoretical finance</b>   Laurent GHEERAERT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S421 <small>(option/optional)</small>	<b>Entrepreneurial ecosystems</b>   Judith BEHRENS (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S492 <small>(option/optional)</small>	<b>Energy policy, sustainability &amp; management</b>   Adel El Gammal (Coordinator), Julien BLONDEAU and Michel HUART ⌚ 5 credits [lecture: 36h, seminars: 24h] 📅 first term 🗨 English
GEST-Y501 <small>(option/optional)</small>	<b>Business Management and Entrepreneurship</b>   Marc Goldchstein (Coordinator) ⌚ 3 credits [lecture: 33h] 📅 first and second terms 🗨 English
LANG-H500 <small>(option/optional)</small>	<b>English for professional purposes</b>   Alexander CORNFORD (Coordinator) ⌚ 5 credits [tutorial classes: 48h, personal assignments: 12h] 📅 first and second terms 🗨 English
PROJ-H421 <small>(option/optional)</small>	<b>Projet polydaire: expériences didactiques innovantes pour le secondaire</b>   Simon-Pierre GORZA (Coordinator) ⌚ 5 credits [project: 150h] 📅 academic year 🗨 French

