# Block view of the study programme

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

**Block 1**

Depending on your educational background or depending on the focus, it is possible that the prerequisites / corequisites for the 1st year of the programme are presented in the block 2. You are therefore invited to read through the list of courses in block 2 even if you are registering for the first time in this master.

As part of the Master in electro-mechanical engineering, students must follow or approve 65 core training credits (including placement and final dissertation), 25 credits of optional courses and 30 credits from one of the two professional focuses. Ideally, students taking the Masters will have acquired the skills and knowledge corresponding to 50 credits for the specific technical classes in the field of "mechanics" and "electricity" organised as part of the Bachelor in civil engineering.

**Compulsory courses**

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|---|---|---|---|---|---|---|
| MECA0522-1 | *Heat exchangers, constructive and fundamental aspects* - Philippe NGENDAKUMANA - [16h Proj.]<br>**Corequisite :**<br>MECA0002-1 - Thermodynamique appliquée et introduction aux machines thermiques | Q1 | 15 | 15 | [+] | **3** |
| CHIM0071-4 | *Reduction of pollutants from combustion* - Angélique LÉONARD - [1d FW] | Q1 | 30 | - | [+] | **3** |
| MECA0006-1 | *Thermal Machines and Systems* - Vincent LEMORT - [4h Proj.]<br>**Corequisite :**<br>MECA0046-1 - Echangeurs de chaleur : aspects réseaux d'échangeurs et U.R.E. | Q1 | 30 | 30 | [+] | **5** |
| MECA0462-2 | *Materials selection* (english language) - Davide RUFFONI - [30h Proj., 1d FW] | Q1 | 30 | 30 | [+] | **5** |
| ELEC0014-3 | *Introduction to electric power and energy systems* (english language) - Thierry VAN CUTSEM - [1d FW]<br>**Corequisite :**<br>ELEC0053-2 - Circuits électriques<br>ELEC0431-2 - Electromagnetic energy conversion | Q1 | 28 | 12 | [+] | **4** |
| MECA0467-1 | *Turbomachines* - Olivier LÉONARD<br>**Corequisite :**<br>MECA0002-1 - Thermodynamique appliquée et introduction aux machines thermiques | Q2 | 30 | 30 | - | **5** |
| SYST0003-1 | *Linear control systems* (english language) - Guillaume DRION - [6h Labo.] | Q1 | 30 | 30 | [+] | **5** |

**Optional courses**

**Choose one focus from the following :**

**Professional focus in energetics**

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|---|---|---|---|---|---|---|
| APRI0003-2 | *Energetics Integrated Project* - Pierre DEWALLEF, Vincent LEMORT, Philippe NGENDAKUMANA - [5d FW]<br>**Corequisite :**<br>MECA0006-1 - Machines et systèmes thermiques<br>MECA0450-3 - Renewable energies<br>MECA0046-1 - Echangeurs de chaleur : aspects réseaux d'échangeurs et U.R.E. | TA | 30 | 80 | [+] | **8** |
| MECA0037-1 | *Thermal power stations and cogeneration* - Pierre DEWALLEF, Angélique LÉONARD - [12h Proj.]<br>**Corequisite :**<br>MECA0046-1 - Echangeurs de chaleur : aspects réseaux d'échangeurs et U.R.E.<br>MECA0467-1 - Turbomachines<br>MECA0002-1 - Thermodynamique appliquée et introduction aux machines thermiques | Q2 | 24 | 24 | [+] | **5** |
| MECA0046-1 | *Heat exchangers : networks and rational use of energy* - MarieNoëlle DUMONT - [20h Proj.] | Q2 | 15 | 5 | [+] | **2** |
| MECA0450-3 | *Renewable energies* (english language) - Pierre DEWALLEF - [24h Proj., 1d FW] | Q1 | 24 | 12 | [+] | **5** |
| ELEC0018-1 | *Energy Market* (english language) - Damien ERNST | Q2 | 45 | 15 | - | **5** |
| MECA0041-1 | *Internal combustion engine* - Philippe NGENDAKUMANA - [1,5d FW, | Q2 | 30 | 30 | [+] | **5** |

20h Proj.]
**Corequisite :**
MECA0002-1 - Thermodynamique appliquée et introduction aux machines thermiques

**Professional focus in sustainable automotive engineering**

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|---|---|---|---|---|---|---|
| PROJ0013-1 | *Innovation project in automotive engineering* (english language) - Olivier BRULS, Georges DE PELSEMAEKER, Grigorios DIMITRIADIS, Pierre DUYSINX, Vincent LEMORT - [80h Proj., 1d FW]<br>**Corequisite :**<br>MECA0492-2 - Vehicle dynamics<br>MECA0497-2 - Vehicle performance | Q1 | 20 | - | [+] | **8** |
| MECA0492-2 | *Vehicle dynamics* (english language) - Pierre DUYSINX<br>**Corequisite :**<br>MECA0493-2 - Vehicle aerodynamics<br>MECA0494-3 - Vehicle components I<br>MECA0496-2 - Materials for automotive applications<br>MECA0493-2 - Vehicle aerodynamics | Q1 | 15 | 10 | - | **2** |
| MECA0493-2 | *Vehicle aerodynamics* (english language) - Grigorios DIMITRIADIS<br>**Corequisite :**<br>MECA0496-2 - Materials for automotive applications<br>MECA0494-3 - Vehicle components I<br>MECA0492-2 - Vehicle dynamics | Q1 | 15 | 10 | - | **2** |
| MECA0494-3 | *Vehicle components I* (english language) - Olivier BRULS, Pierre DUYSINX<br>**Corequisite :**<br>MECA0496-2 - Materials for automotive applications<br>MECA0493-2 - Vehicle aerodynamics<br>MECA0492-2 - Vehicle dynamics | Q1 | 25 | 15 | - | **3** |
| MECA0496-2 | *Materials for automotive applications* (english language)<br>**Corequisite :**<br>MECA0494-3 - Vehicle components I<br>MECA0493-2 - Vehicle aerodynamics<br>MECA0492-2 - Vehicle dynamics | Q1 | 15 | 10 | - | **2** |
| MECA0497-2 | *Vehicle performance* (english language) - Mustapha BELHABIB, Pierre DUYSINX - [1d FW]<br>**Corequisite :**<br>MECA0501-1 - Thermal and Electrical Management of vehicles<br>MECA0500-2 - Hybrid electric and fuel cell vehicles<br>MECA0499-2 - Electric traction motors<br>MECA0498-2 - Internal combustion engines | Q1 | 25 | 15 | [+] | **3** |
| MECA0498-2 | *Internal combustion engines* (english language) - Philippe NGENDAKUMANA<br>**Corequisite :**<br>MECA0501-1 - Thermal and Electrical Management of vehicles<br>MECA0500-2 - Hybrid electric and fuel cell vehicles<br>MECA0499-2 - Electric traction motors<br>MECA0497-2 - Vehicle performance | Q1 | 25 | 15 | - | **3** |
| MECA0499-2 | *Electric traction motors* (english language) - Johan GYSELINCK<br>**Corequisite :**<br>MECA0501-1 - Thermal and Electrical Management of vehicles<br>MECA0500-2 - Hybrid electric and fuel cell vehicles<br>MECA0498-2 - Internal combustion engines<br>MECA0497-2 - Vehicle performance | Q1 | 15 | 10 | - | **2** |
| MECA0500-2 | *Hybrid electric and fuel cell vehicles* (english language) - Pierre DUYSINX, Nathalie JOB<br>**Corequisite :**<br>MECA0501-1 - Thermal and Electrical Management of vehicles | Q1 | 25 | 15 | - | **2** |

MECA0499-2 - Electric traction motors
MECA0498-2 - Internal combustion engines
MECA0497-2 - Vehicle performance

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|---|---|---|---|---|---|---|
| MECA0501-1 | *Thermal and Electrical Management of vehicles* (english language) - Vincent LEMORT<br>**Corequisite :**<br>MECA0500-2 - Hybrid electric and fuel cell vehicles<br>MECA0499-2 - Electric traction motors<br>MECA0498-2 - Internal combustion engines<br>MECA0497-2 - Vehicle performance | Q1 | 15 | 10 | - | **3** |

**Research focus**

Aimed at students who have taken this focus in 2015-2016.

**Block 2**

Depending on your educational background or depending on the focus, it is possible that the prerequisites / corequisites for the 1st year of the programme are presented in the block 2. You are therefore invited to read through the list of courses in block 2 even if you are registering for the first time in this master.

**Compulsory courses**

| | | | | | | |
|---|---|---|---|---|---|---|
| ATFE2003-1 | *Final work* - COLLÉGIALITÉ, Pierre DEWALLEF - [750h Proj.] | TA | - | - | [+] | **25** |
| ASTG0117-1 | *Integration internship* (english language) - Pierre DEWALLEF<br>**Corequisite :**<br>ATFE2003-1 - Travail de fin d'études<br>GEST3162-1 - Principles of management | TA | - | - | - | **5** |
| GEST3162-1 | *Principles of management* (english language) - Michael GHILISSEN, François PICHAULT, Thierry PIRONET, Didier VAN CAILLIE - Suppl : Fanny FOX | Q1 | 25 | 25 | - | **5** |

**Optional courses**

Choose courses totalling 25 credits from the elective courses list.

**Students who have not followed the courses MECA0002-1, ELEC0053-2 and ELEC0431-2 from the bachelor in civil engineering programme or acquired the equivalent knowledge and skills have to choose in priority these three courses in their study programme ; theses courses are corequisites of compulsory courses of the master.**

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|---|---|---|---|---|---|---|
| PROJ0011-1 | *Personal student project* (english language) - Bernard BOIGELOT, COLLÉGIALITÉ - [150h Proj.] | TA | - | - | [+] | **5** |
| MECA0002-1 | *Applied Thermodynamics and Introduction to Heat Engines* - Olivier LÉONARD | Q1 | 30 | 30 | - | **5** |
| ELEC0053-2 | *Electric circuits* - Patricia ROUSSEAUX | Q2 | 30 | 30 | - | **5** |
| ELEC0431-2 | *Electromagnetic energy conversion* (english language) - Christophe GEUZAINE - [15h Labo.] | Q2 | 30 | 15 | [+] | **5** |

**Language courses**

[...] Maximum five language course credits from among the list below or from among the ISLV courses in other faculties

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|---|---|---|---|---|---|---|
| LANG1957-1 | *Dutch for Engineers, part 1* (dutch language) - Claudine COLIN | Q1 | 36 | - | - | **3** |
| LANG2978-1 | *Dutch for engineer, part 2* - Claudine COLIN | Q2 | 24 | - | - | **2** |
| LANG1958-1 | *German for engineer, Part 1* (german language) - Françoise CARL | Q1 | 36 | - | - | **3** |
| LANG2979-1 | *German for engineers, part 2* - Françoise CARL, ISLV | Q2 | 24 | - | - | **2** |

**Power production, transport and distribution**

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|---|---|---|---|---|---|---|
| CHIM0664-1 | *Electrochemical energy conversion and storage* (english language) - Nathalie JOB - [15h Labo.] | Q1 | 15 | - | [+] | **3** |

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|---|---|---|---|---|---|---|
| ELEC0041-1 | *Modelling and design of electromagnetic systems* (english language) - Patrick DULAR, Christophe GEUZAINE | Q2 | 30 | 30 | - | **5** |
| GENU0018-3 | *Nuclear Engineering and Nuclear Power Plant Technology* - Pierre DEWALLEF (Even years)<br>**Prerequisite :**<br>MECA0037-1 - Centrales thermiques et cogénération | Q1 | 30 | 30 | - | **5** |
| ELEC0047-1 | *Electric power systems dynamics, control and stability* (english language) - Thierry VAN CUTSEM - [25h Proj.]<br>**Prerequisite :**<br>ELEC0014-3 - Introduction to electric power and energy systems<br>**Corequisite :**<br>ELEC0029-2 - Electric power systems analysis | Q1 | 30 | 8 | [+] | **5** |
| ELEC0055-1 | *Electronic control systems* (english language) - Fabrice FREBEL | Q1 | 30 | 30 | - | **5** |
| MECA0033-1 | *Heat and Material Transfer Modelling* - N... | | 30 | 30 | - | **5** |
| ELEC0029-2 | *Electric power systems analysis* (english language) - Thierry VAN CUTSEM - [25h Proj.]<br>**Prerequisite :**<br>ELEC0014-3 - Introduction to electric power and energy systems | Q2 | 16 | 4 | [+] | **3** |
| ELEC0436-1 | *Electric Energy Management Systems* (english language) - Patricia ROUSSEAUX - [12h Labo., 20h Proj.]<br>**Prerequisite :**<br>ELEC0014-3 - Introduction to electric power and energy systems | Q1 | 20 | 16 | [+] | **5** |
| ELEC0445-1 | *High Voltage Direct Current (HVDC) grids* (english language) - Patricia ROUSSEAUX | Q2 | 16 | 12 | - | **3** |
| **Rational use of energy in buildings and industry** | | | | | | |
| ARCH0117-1 | *Introduction to building thermals* - JeanMarie HAUGLUSTAINE | Q1 | 15 | 15 | - | **3** |
| MECA0034-1 | *Rational use of energy in buildings* - Vincent LEMORT<br>**Prerequisite :**<br>MECA0006-1 - Machines et systèmes thermiques | Q1 | 30 | 30 | - | **5** |
| ELEN0074-1 | *Sensors, microsensors and instrumentation* (english language) - Philippe VANDERBEMDEN - [20h Labo.] | Q2 | 30 | - | [+] | **5** |
| ENVT0026-1 | *Industry*<br>*- Part 1 : Tools for a more sustainable industry (product life cycle analysis, best available technologies, sustainable chemistry)* - Sandra BELBOOM, Angélique LÉONARD<br>*- Part 2 : Rational use of energy in industry* - Vincent LEMORT | Q2 | 15<br>15 | 10<br>10 | -<br>- | **5** |
| **Energy and mobility** | | | | | | |
| MECA0478-4 | *Electric, hybrid and non-conventional propulsion systems* - Pierre DUYSINX - [6h Labo., 16h Proj.] | Q1 | 30 | 8 | [+] | **5** |
| **Advanced modeling and simulation** | | | | | | |
| MECA0032-1 | *Flow in turbomachineries* (english language) - Olivier LÉONARD - [60h Proj.] | TA | 30 | 30 | [+] | **5** |
| MECA0124-1 | *Combustion Modelling* - Philippe NGENDAKUMANA | Q1 | 30 | 30 | - | **5** |
| MECA0514-1 | *Introduction to dynamic modeling of thermal systems* - Sylvain QUOILIN (Odd years)<br>**Prerequisite :**<br>MECA0006-1 - Machines et systèmes thermiques | Q1 | 15 | 15 | - | **3** |
| MECA0515-1 | *Advanced thermal systems* (english language) - Vincent LEMORT<br>**Prerequisite :**<br>MECA0006-1 - Machines et systèmes thermiques | Q2 | 15 | 15 | - | **3** |
| MATH0461-2 | *Introduction to numerical optimization* (english language) - | Q1 | 30 | 20 | [+] | **5** |

OUVEAUX - [25h Proj.]

**Optional courses**

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|---|---|---|---|---|---|---|
| MECA0018-2 | (pas organisé en 2016-2017) *Manufacturing processes* (english language) | Q2 | 30 | 30 | - | **5** |
| MECA0027-1 | *Structural and multidisciplinary optimization* (english language) - Pierre DUYSINX, Patricia TOSSINGS - [18h Proj.] | Q1 | 30 | 12 | [+] | **5** |

[...] Choose one course from the course's programme of other master of the Faculty of Applied Sciences (with the approval of the cycle's Jusry president)

**Bloc d'aménagement du programme de l'année**

# Additional ECTS Master in electro-mechanical engineering

**Optional courses**

Each student¿s programme will be determined by the jury depending on their prior training. If an applicant does not meet certain prerequisites, his or her programme may include up to 60 additional course credits essentially taken from the list below :

| | | | | | | |
|---|---|---|---|---|---|---|
| MECA0445-2 | *Heat transfer* (english language) - Pierre DEWALLEF, Vincent TERRAPON - [4h Labo., 9h Proj.] | Q2 | 30 | 26 | [+] | **5** |
| MECA0012-6 | *Solid mechanics* - Laurent DUCHENE - [15h Proj.] | Q2 | 30 | 30 | [+] | **5** |
| ELEC0052-2 | *Analysis and Design of Electrical Measuring Systems* - Philippe VANDERBEMDEN - [24h Labo.] | Q1 | 30 | 6 | [+] | **5** |
| MECA0025-3 | *Fluid Mechanics* - Eric DELHEZ - [30h Proj.] | Q2 | 30 | 30 | [+] | **5** |
| MECA0036-2 | *Finite Element Method* (english language) - JeanPhilippe PONTHOT - [40h Proj.] | Q2 | 30 | 30 | [+] | **5** |
| MECA0155-2 | *Dynamics of Mechanical Systems* - JeanClaude GOLINVAL - [5h Labo., 10h Proj.] | Q1 | 30 | 30 | [+] | **5** |
| PHYS0904-4 | *Physics of materials* - - Suppl : Luc COURARD, Anne HABRAKEN, Anne MERTENS - [1d FW] | Q2 | 30 | 30 | [+] | **5** |
| MATH0006-3 | *Introduction to numerical analysis* (english language) - Quentin LOUVEAUX | Q1 | 20 | 20 | - | **4** |
| MECA0001-2 | *Mechanics of materials* - JeanPierre JASPART - [2h Labo., 12h Proj.] | Q1 | 30 | 28 | [+] | **5** |
| LANG0039-2 | *English 2* (english language) - Christine FILOT, ISLV - [20h Proj.] | TA | - | 30 | [+] | **3** |

[...] Choose maximum 13 credits to complete the curriculum